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Volume Fifty-One

OBSTETRICAL AND GYNECOLOGICAL NUMBER

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Kaliski, S. R., and Mitchell, D. D.: Treatment of Diarrhea with Carob Flour, Texas State J. Med. 46:675 (Sept.) 1950.

Andrews, H. S.: The Use of Carob Flour in Gastro-Intestinal Disturbances, J. Kentucky State H.A. 49:279 (July) 1951.

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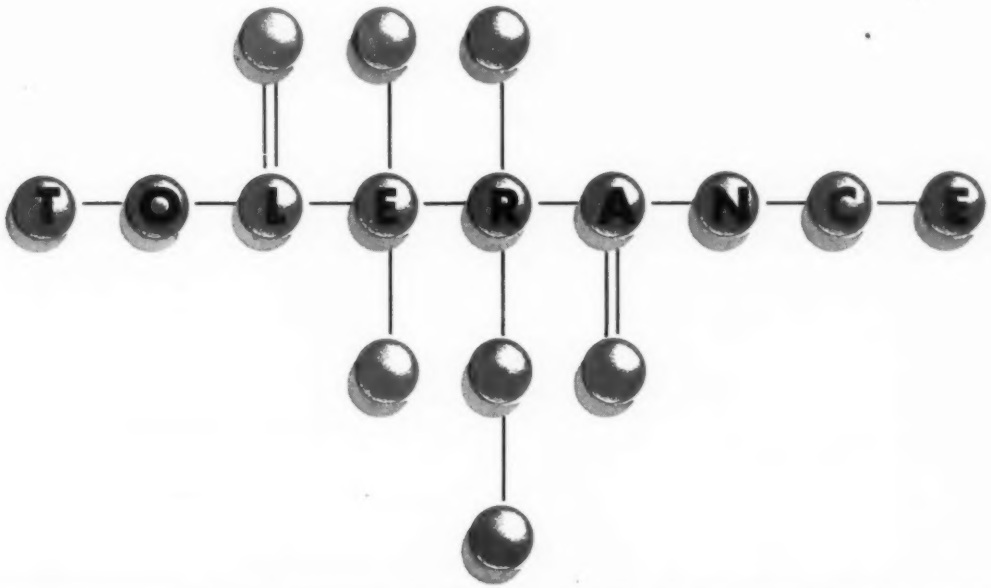

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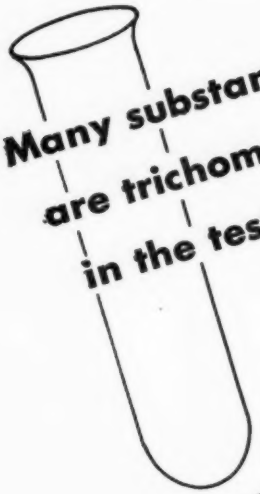

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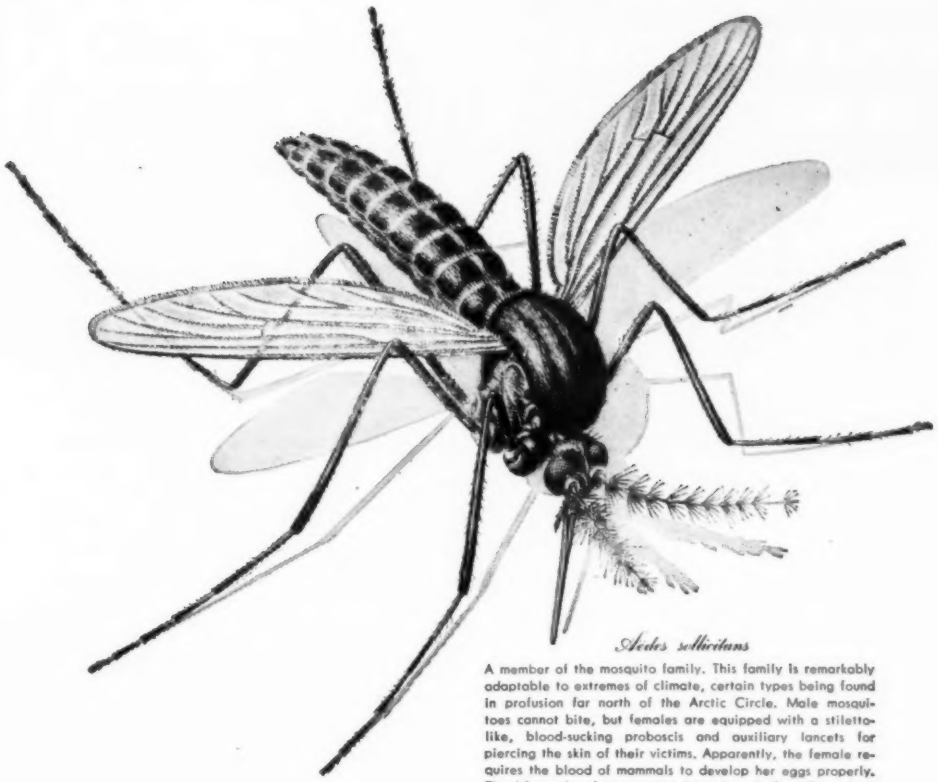

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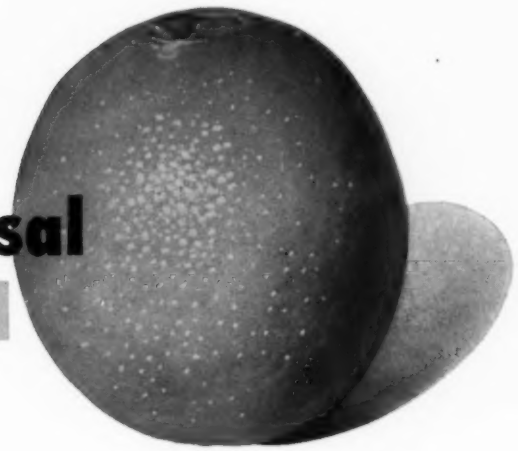

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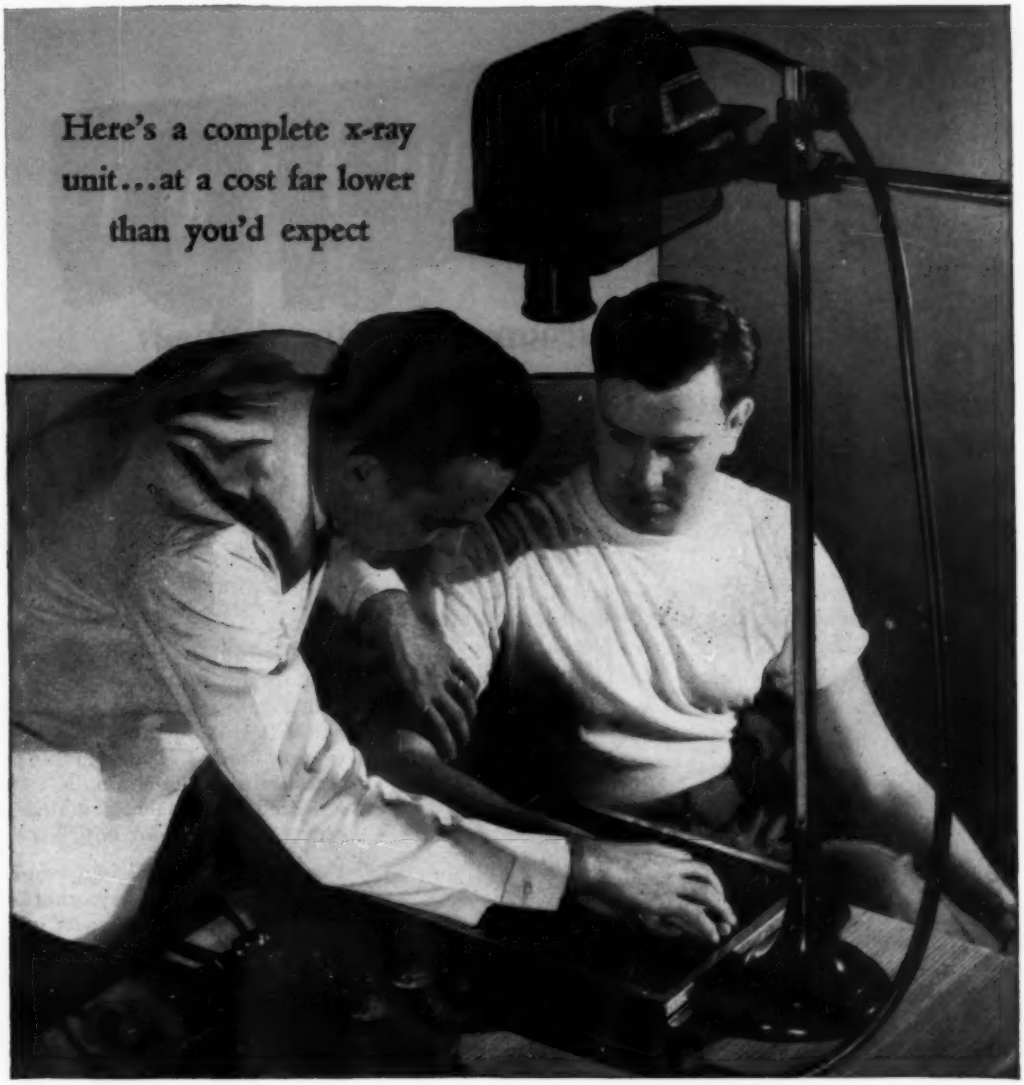

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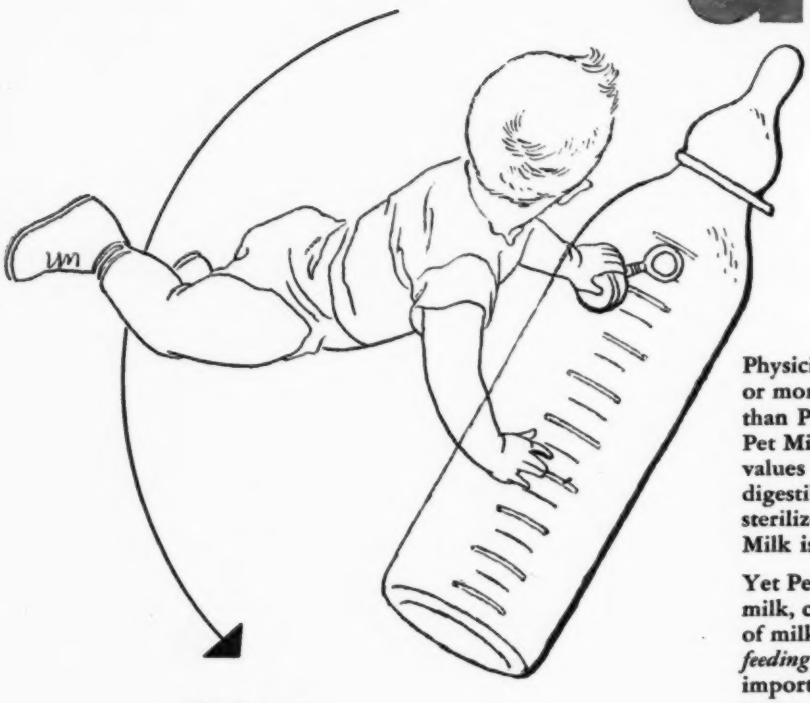

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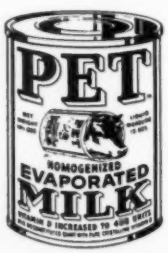

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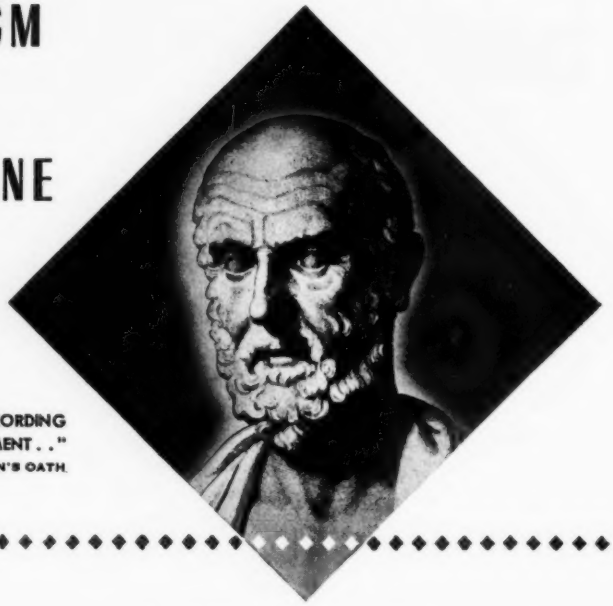

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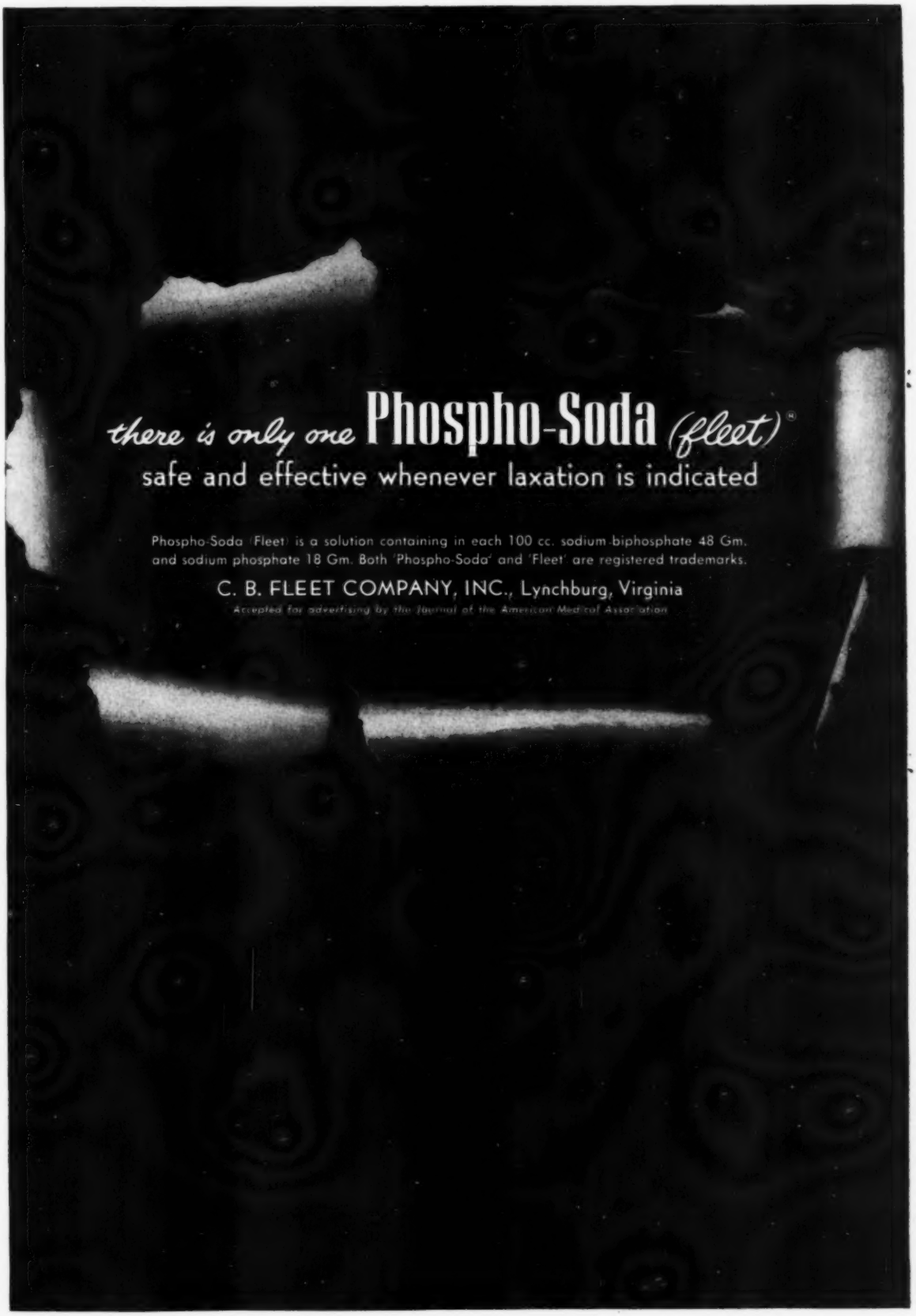
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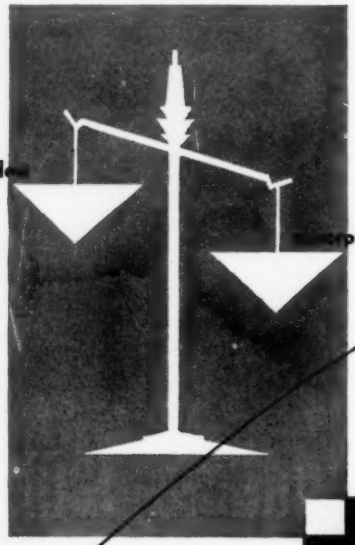

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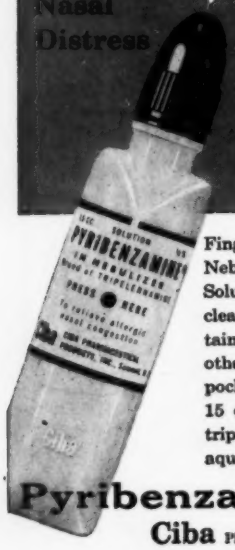

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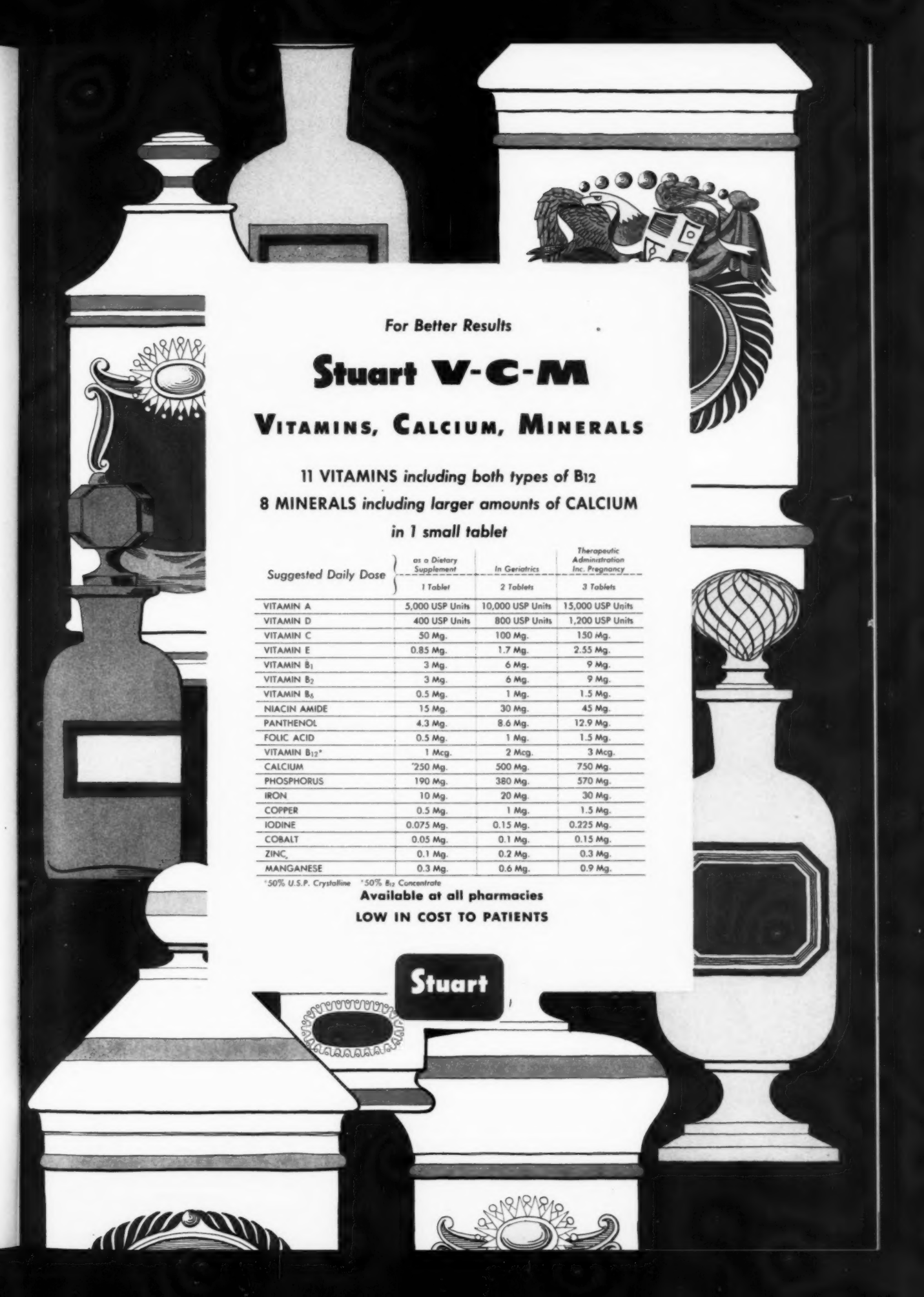

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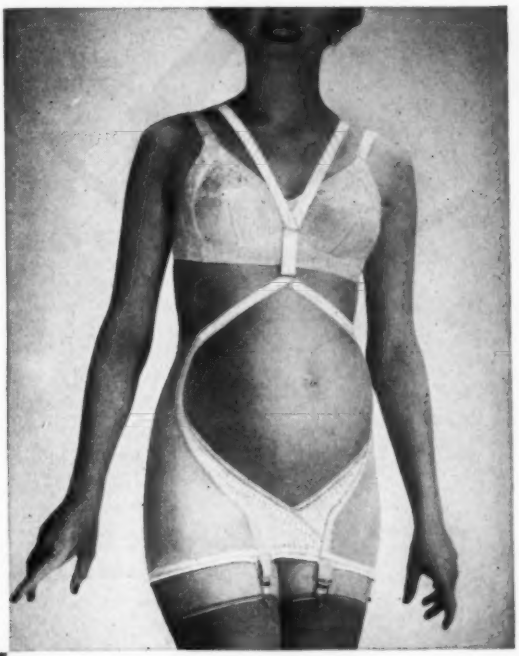

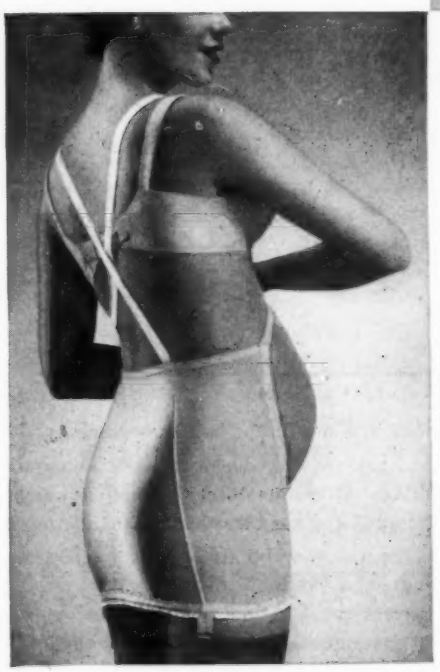

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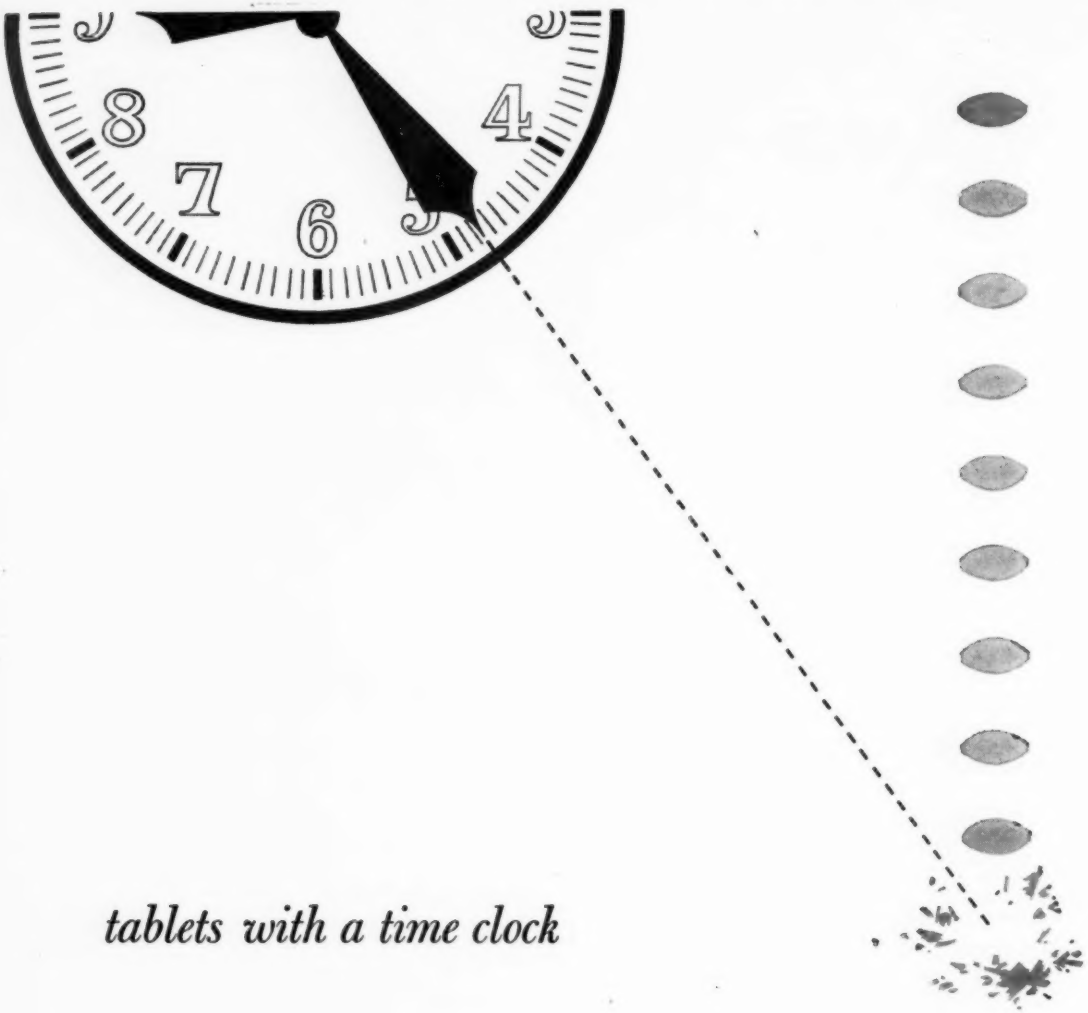

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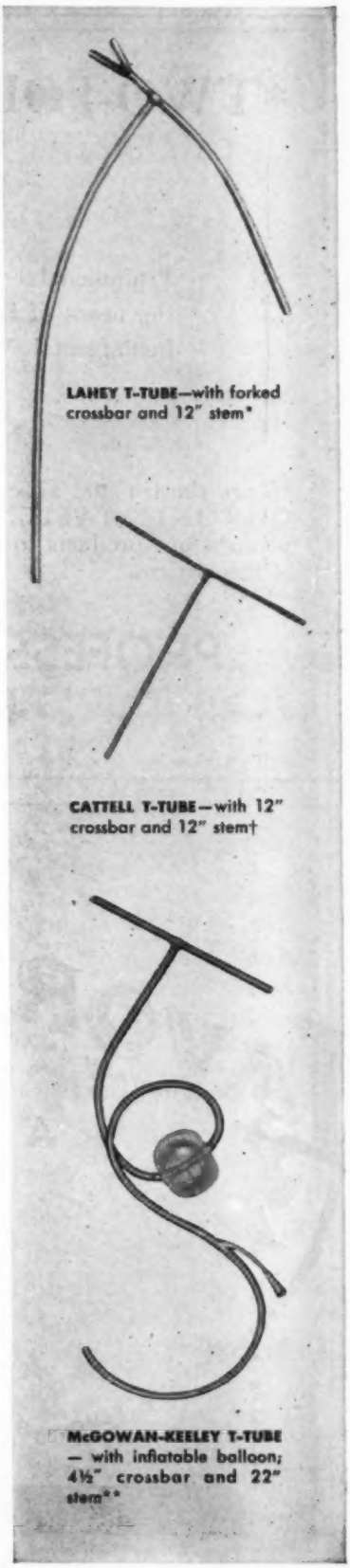

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Surgery, Gynecology & Obstetrics, July, 1950, No. 1—Vol. 91

†*The Lahey Clinic Bulletin, January, 1946 Issue*

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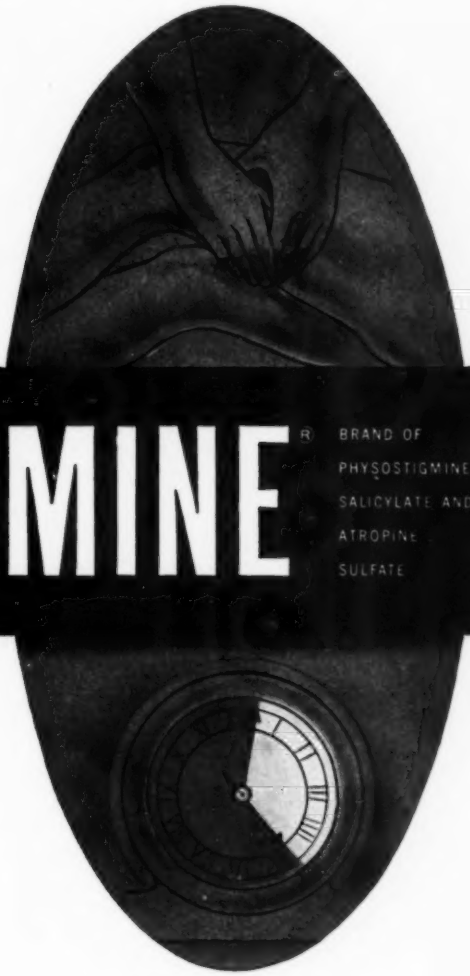

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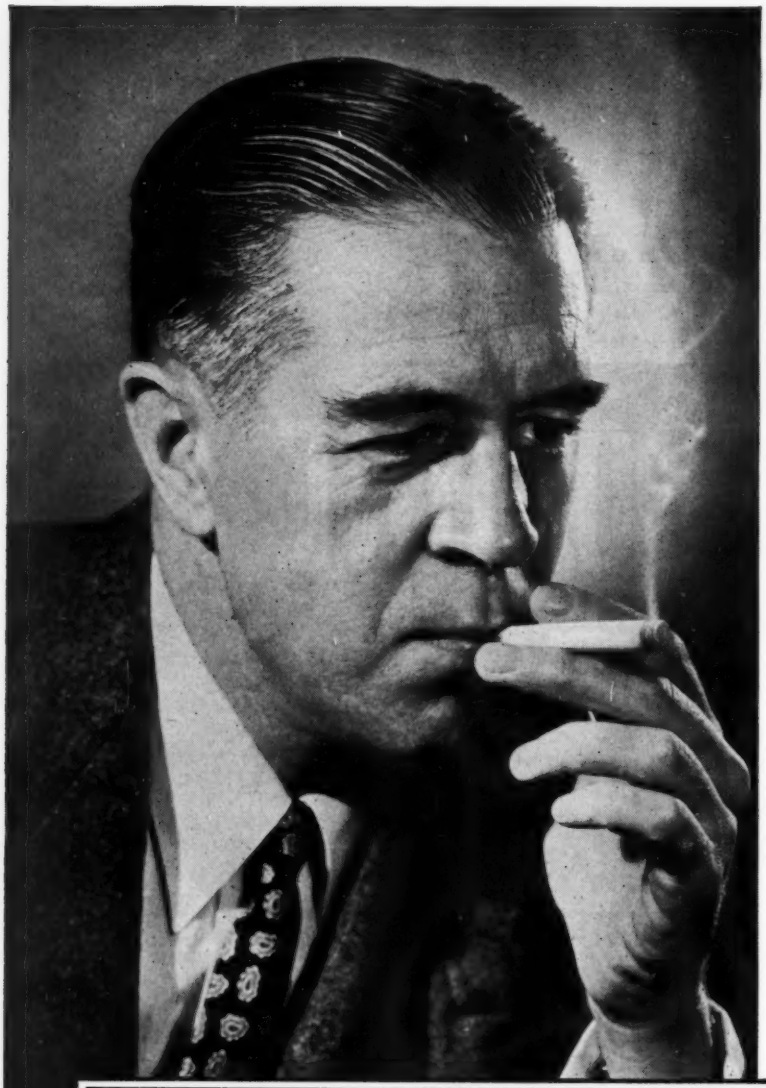

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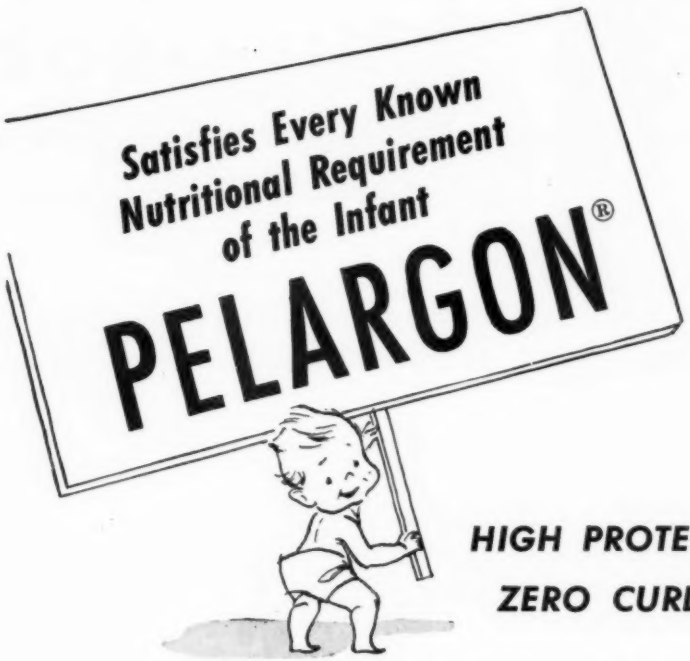

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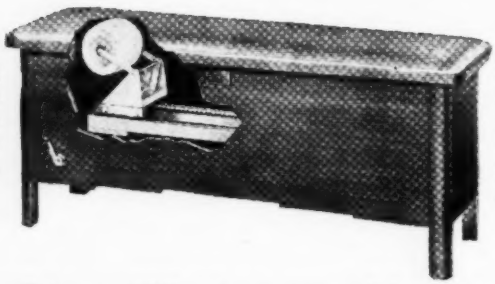

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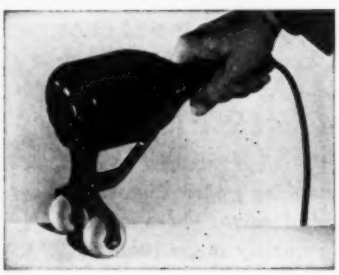

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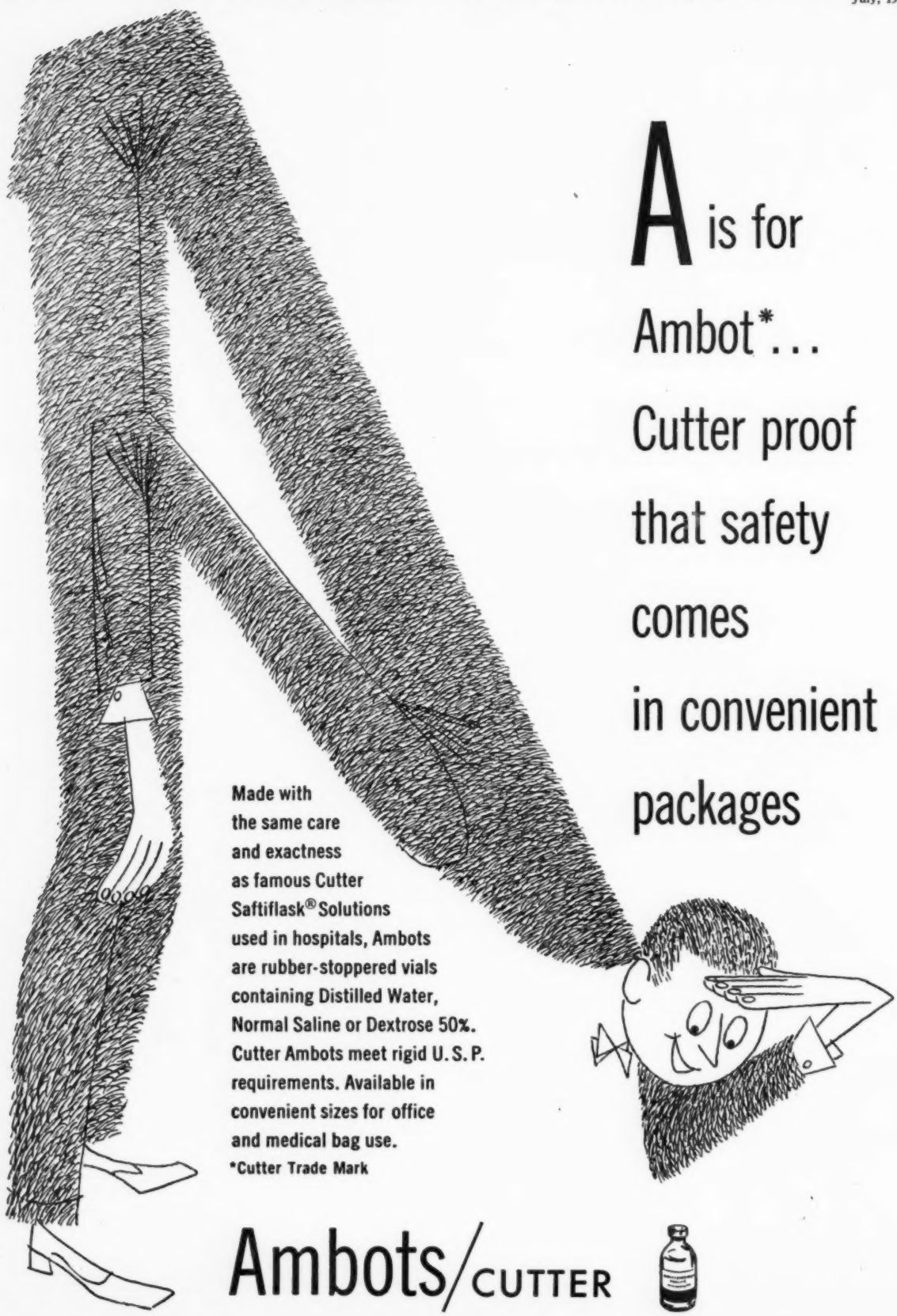

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The Resuscitation of Patients Who Die in the Operating Room

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Cleveland

INTRODUCTION

Nothing in the entire field of medicine and surgery can compare in dramatic intensity and urgency to cardiac arrest when it occurs in the operating room. The responsibility for action in such cases has always rested with the anesthesiologist and the surgeon, but in the past, and in many institutions today, neither was prepared with an effective plan of action. The recent work of Claude S. Beck, professor of neurosurgery at Western Reserve University, makes available a scientific and practical approach to resuscitation which, once widely known and practiced, will lessen the incidence of a tragedy against which there has been no concerted safeguard.

As yet the Beck technic is not widely practiced, and there are many hospitals, large and small, throughout America that know little of the procedure or ignore its possibilities. Individual and institutional inertia and lethargy play a role. However, it seems reasonable to assume that within the foreseeable future all hospitals will provide this service or be forced to face the legal charge of medical neglect. The successful treatment of cardiac arrest is now an established fact. But such treatment remains too often unavailable.

Under the auspices of the Cleveland chapter of the American Heart Society, teaching demonstrations of cardiac resuscitation by the Beck method have been made available by means of 2-day courses given at monthly intervals to physicians, especially surgeons and anesthesiologists. These courses now in their second year have attracted individuals over a nationwide area and have been the subject of enthusiastic comment by all who have had an opportunity to participate in them.

It is the purpose of this paper to give in detail the steps of the technic, following closely the methods outlined by Dr. Beck[1] and as presented in the resuscitation course. Too much emphasis cannot be placed on the necessity for thorough mastery of the technic by the resuscitation team on which the anesthesiologist and the surgeon are of primary importance. This team must be capable of precise and decisive action, without losing a second of time once the emergency arises. So important is this that routine drills upon the part of those responsible should be a part of every operating room requirement. Only in this way can the meaningless chaos that reigns in an operating room when cardiac arrest is detected—all too often, too late—be replaced by a reasoned and ordered approach.

CAUSES OF OPERATING ROOM DEATH

It is not within the scope of this paper to enumerate all of the various causes of death in the operating room. In some patients the cause may be clear; in others it may be only a link in a chain of events that precipitates the immediate difficulty. It will be helpful, however, to think of certain causes as *predisposing* factors, mainly cardiocirculatory in origin, where the delivery of oxygenated blood to the heart and brain is inadequate. A breakdown in the transport of oxygen either by an airway obstruction or by failure in oxygen interchange by the blood is often present. The effect of surgical manipulation upon reflex activity must be considered. *Precipitating* factors are more readily ascertained and most often result from an overdose of an anesthetic agent (including premedication) and/or an acute anoxia from any cause.

In general terms the immediate cause of death is always an interruption of respiration or circulation. It must be clearly understood that interruption of respiration or circulation can last for no more than a few moments without fatality; interruption of one causes failure of the other. Respiration and circulation are essential to maintaining the continuous oxygen supply necessary for life.

Failure of the heart may be due to one of many causes. It appears that disease of the heart makes it susceptible to untoward circumstances that might otherwise be tolerated. The functional capacity of the myocardium may be reduced despite an orderly excitation if the contractural responses of individual fibers are impaired. The quality of gasoline and its rate of supply to a carburetor determine the efficiency of the explosion induced by a spark in an automobile engine; similarly, the availability of explosive material in muscle cells, high energy, organic phosphates, nitrogen, et cetera, and the rate of regeneration during diastole determine the effectiveness of contractions realized. Both of these processes depend upon the efficiency of the coronary circulation.

Space does not permit a complete examination of all the factors which may produce cardiac arrest. A

few factors which may cause changes in heart rate in the course of a surgical procedure may be mentioned. In some cases if its surface is touched the heart develops tachycardia which may be followed by ventricular fibrillation. Secondary factors that can produce cardiac asystole or ventricular fibrillation include the various anesthetic agents, anoxemia, retention of carbon dioxide, loss of blood, and arterial hypotension. The heart undoubtedly can be stopped by vagal reflexes and by inadequate filling. The latter occurs as a result of stab wounds to the heart, hemorrhage or effusions in the pericardium, tight scars around the heart, in pressure pneumothorax, during the removal of large abdominal tumors, and after childbirth. After removal of tumors or large quantities of fluid from the abdominal cavity or after childbirth blood may pool in the abdominal viscera and an insufficient amount return to the heart.

Various types of manipulation during operations can interrupt the heart. Torsion of the heart or angulation from its normal position are deleterious. Ventricular fibrillation can result from pressure upon a coronary artery. The heart has occasionally been observed to stop beating without obvious reasons during operations upon the heart, aorta, and pulmonary artery.

All known anesthetic agents exert some depressive effects on the metabolic processes of the heart; however, the effect of some agents is minimal. Volatile anesthetics may induce reflex central nervous and psychic reactions. Their effects on myocardial response have not been shown to be serious except in the case of a few, especially chloroform and cyclopropane, which may cause serious arrhythmias through central nervous reaction and may lead to ventricular fibrillation.

Interference with the respiratory system may occur at various points. For example, increased intracranial pressure resulting from cerebral tumors or edema may inactivate the respiratory center, or the center may be paralyzed from generalized anoxia resulting from heart failure, from a poorly functioning airway, or from a greatly prolonged period of anesthesia in which oxygenation is maintained at a subminimal level. It is well established that interference with any of the several controls of the respiratory center can interrupt its function. Hypocapnia, hypercapnia, alterations in the pH of the blood, and reflex effects from the periphery may be responsible.

It must be remembered that the lungs and respiratory muscles are equally as essential to respiration as the respiratory center and that their efficient function is absolutely dependent upon an adequate airway. Conditions disturbing respiration include dislocation and collapse of the trachea, tracheal foreign bodies, pulmonary edema and consolidation, and inadequate expansion of the chest. Insufficient oxygen in inhaled gas or inadequate transfer within the lungs resulting from hemorrhage, anemia, or carbon monoxide poisoning may be at fault.

Abnormal respiratory mechanisms or circulatory systems can be interrupted by any one of many conditions that ordinarily would be well tolerated. As examples, a patient with a brain tumor may stop breathing when placed prone on the operating table; one with pericardial effusion may die when he is transferred from an oxygen tent to the operating table; one with coronary artery disease may die when placed in a recumbent position or when placed face down while under inhalation anesthesia; and an obese patient may not tolerate upward pressure on the diaphragm. The position of the head may interfere with the airway, the free movement of the chest may be interfered with by position, or blood may pool in the extremities when the patient is operated on in a sitting position.

It is also a well-known fact that many times cardiorespiratory failure may occur before the incision is made. It may occur suddenly and unexpectedly, and if any warning signals occur they must be instantly detected and appropriate corrective action instituted immediately to prevent disaster. Increase in the incidence of early failure has occurred with the wider use of spinal anesthesia in which the danger period is the first 20 to 30 minutes.

ROUTINE EQUIPMENT FOR RESUSCITATION

Beck continually emphasizes that a precise plan for action and the availability of certain instruments and supplies are the primary prerequisites for success in resuscitation. Special packages of supplies should be prepared, sterilized, and kept at hand. It is not necessary to include sterile gowns, linens, and gloves, but a scalpel, self-retaining retractor, hemostats, a rib shear, sutures, needles, sponges, and scissors are essential. A set of intratracheal tubes and the rubber bag of the anesthetic machine ready to fill with oxygen must be part of the equipment available.

The drugs used are epinephrine and procaine hydrochloride. The epinephrine should be diluted by mixing 1 cc. of a standard 1:1,000 solution with 9 cc. of normal sodium chloride solution. Procaine hydrochloride is used in 1 or 2 per cent solutions. The two drugs must be available but need not be included in the sterile package; however, two 10 cc. syringes with suitable needles and two medicine glasses should be kept in it.

Electrodes and a shocking device are required equipment. Both can be made by an electrician. The electrodes, which must be kept in the sterile package, are about 7 cm. in diameter. The shocking device should be kept in the operating room. It utilizes 110 volt alternating current and delivers approximately 1.5 amperes to the heart. The surgeon must be insulated from the current, and the patient should not be connected to the electrocardiograph when the shock is applied.

THE RESUSCITATION PROCEDURE

In describing the resuscitation procedure, Beck states that recognition of the existence of its two components is important. They are (1) restoration of the oxygen system and (2) restoration of the normal rhythm of the heart. The first is the emergency act. The surgeon and anesthetist have from 3 to 5 minutes to place this system in operation: if they take longer, irreversible brain damage may occur, making complete recovery impossible. The normal heartbeat can be restored at almost any time after the oxygen system has been restored, and normal respiration will be resumed, providing the respiratory center has not been damaged. The existence of the time limit for the restoration of the oxygen system is the cause of most failures. As soon as either respiration or the heart has stopped, the surgeon and the anesthetist must recognize the emergency. No time can be lost if it is to be met successfully.

In meeting the emergency there are certain positive steps to be taken. However, it seems wise to state what steps should *not* be taken. In the words of Beck,[1] "The most important thing to avoid is to take time in order to make sure that the patient is dead. Do not listen for a faint heart sound which may or may not be present. The surgeon need not be fearful that he will open the chest and then find a vigorously beating heart. If there is no palpable pulse, no blood pressure, and if respiration has ceased, he can be certain that any slight movement of the heart which may still be present is of no consequence. Do not wait for an electrocardiogram. Do not inject epinephrine through the chest wall into the heart. Do not dilate the rectal sphincter. Do not try to give mechanical respiration by compression of the chest. Do not give a blood transfusion. Do not given an intra-arterial transfusion. The time taken to carry out these steps will preclude success in almost all cases."

Restoration of the Oxygen System.—Now attention can be directed to things to be done. The first thing is to place a properly fitting tube in the trachea and then inflate and deflate the lungs adequately by compression of a rubber bag filled with oxygen. If the tracheal tube is in place when failure occurs, so much the better. An intratracheal tube is an important safety factor for all operations. However, if it is not already in place, a tube of proper size must be immediately available, and the anesthetist should be prepared to introduce it without delay. Hesitation in carrying out intubation means disaster.

By the time the tube has been introduced, the surgeon will be well on his way to having the chest open so he can squeeze the heart. When he is able to compress the heart against the sternum and empty it, the crisis is over.

The anesthetist has introduced oxygen into the lungs, and the surgeon has circulated the oxygen to the brain. These simple steps could be carried out in routine fashion were it not for the requisite haste which places a premium on preparation and readiness.

The heart is best approached through an opening through the ribs on the left side. The surgeon should not take time to count the interspaces; he should estimate the fourth or fifth, and cut toward the sternum laterally for about 10 inches and into the pleural cavity. A cartilage above and a cartilage below are cut and an assistant opens the wound while the surgeon places his fingers on the heart. Bleeding does not occur because there is no blood pressure. Although the surgeon may encounter some difficulty getting his wrist through the opening, it is of short duration for after the heart has been squeezed a few times a self-retaining retractor can be placed which will provide room for the hand. Shaving the precordium, cleansing the skin, draping the chest, and the condition of surgeon's hand, gloves, and gown are forgotten. With the proper preparation for resuscitation before the crisis occurs, aseptic technic is already on the scene. Flaws can be taken care of after the heart has been massaged. The attention of surgeon and anesthetist should first be directed toward determining whether the lungs are expanding well with inspiration and going down nicely with expiration, because good expansion of the lungs is essential.

The best method for massage of the heart must be decided by the surgeon. The most usual one is to place the fingers beneath the heart and squeeze the heart against the sternum. Massage can be carried out in some cases by placing the palm and fingers of the right hand beneath the heart and two fingers of the left hand in front of it. The massage should empty both ventricles.

Although the heart does not fill quickly enough to enable one to massage it as rapidly as it normally beats, the rate of approximately 60 to 70 per minute is possible and will produce blood pressure of 60 to 70 mm. mercury, which is adequate to protect the brain. Higher blood pressure can be produced by manual massage after epinephrine has been injected into the heart.

The pericardium prevents the hand from getting under the heart satisfactorily in some cases. In such cases the pericardium should be cut rapidly from one end to the other. The phrenic nerve lies well over to one side.

Restoration of the Heart Beat.—As a rule the heart requires little encouragement; sometimes it starts to beat as soon as it is massaged. The ease with which the beat is often restored brings into tragic relief the failure if action has not been quick enough to save the brain.

When resuscitation is begun it is not known whether the heart is in ventricular asystole or ventricular fibrillation. Since the procedure differs according to the conditions, the surgeon must stop the massage momentarily and observe the ventricles. In the absence of fibrillary movements it can be assumed that the ventricles are in asystole. When fibrillary movements can be seen, an electrocardiogram should be obtained before defibrillation if a direct-writing electrocardiograph is available. If this desirable equipment is not at hand, clinical obeservation will serve to determine if the heart should be defibrillated.

Drugs Used: Only two drugs are used, epinephine and procaine. They are injected, using a needle that is not too large, directly into the right ventricle or into either auricle; after the needle is introduced, a little blood should be withdrawn to make sure it is in the cavity.

Epinephrine increases the tone of the heart to the extent that it is readily felt while the heart is being massaged. The heart becomes firm and often begins to develop weak contractions promptly. Since epinephrine is considered to predispose to fibrillation, it is not employed if the ventricles are fibrillating. The general rule for dosage is to use the smallest amount necessary to produce the physiologic effect which is sought. Repeated injections of large doses become increasingly ineffective until the heart fails to respond. A single injection should consist of 5 to 10 cc. of a diluted solution (1:10,000) of epinephrine. The tenfold dilution is used to provide a greater quantity of solution so that it may reach the entire myocardium.

Procaine decreases the irritability of the heart and thus makes it less susceptible to ventricular fibrillation. Because it also reduces ventricular tone, it should not be used in any larger doses than necessary—usually 5 cc. of a 1 or 2 per cent solution for each injection. Electric shock by itself does not abolish ventricular fibrillation as a rule but it succeeds if the correct dose of procaine has been injected before the shock is applied. Several injections may be needed.

Ventricular Asystole: Massage alone may start the heart in asystole beating. If it does not, epinephrine is injected and the massage is continued. Then beating will start if all conditions are favorable. If it fails

to do so, respiration should be checked and the movement of the lungs and the color of the heart observed. It should be pink. If after 2 or 3 minutes of massage, the heart does not begin beating, epinephrine should be injected for the second time. Massage is continued after another 5 minutes; if there is still no beat, injection is again repeated. If the third attempt fails, an electrocardiogram should be made to rule out the presence of ventricular fibrillation. In the absence of fibrillation, if beating does not begin after five or six injections of epinephrine, faulty aeration of the lungs, faulty massage of the heart, or intrinsic cardiac disease is the cause, for the beat can be restored in any normal heart.

The importance of pulmonary movements is again emphasized. The lungs must inflate well with each inspiration and deflate with each expiration. The common causes of failure to restore the heart beat are inadequate oxygenation of the blood and inadequate discharge of carbon dioxide. A mechanical respirator is of assistance in difficult cases. However, the anesthetist can inflate the lungs by squeezing the gas bag, and usually this is adequate. It should be remembered that sometimes the heart cannot be restored for 1 or 2 hours; in such cases a respirator is almost essential. If a closed-oxygen system is used the carbon dioxide must be absorbed by fresh soda lime.

Ventricular Fibrillation: Procaine and epinephrine, together with the application of an electric shock to the ventricles, are usually required for defibrillation. Human ventricles have been successfully defibrillated without electric shock, but in general the method of defibrillation requires that steps be taken to abolish fibrillation before the coordinated heart beat can be restored. Five cc. of a 1 or 2 per cent solution of procaine are injected into the cavity of the right ventricle and the heart massaged to distribute the drug through the coronary circulation.

Electrodes are then placed on each side of the heart in such a fashion that as much muscle as possible lies between them and shock applied by closing the circuit momentarily. As the current flows through the heart the muscle fibers contract and when the current is broken the ventricles are either in asystole or have resumed fibrillation. In the former case epinephrine and massage are used as described above. If fibrillation recurs the massage is continued, and then the procaine and shock procedure is repeated. If fibrillation still persists after two shocks, massage is continued and epinephrine is used. Administering epinephrine in the presence of fibrillation is contrary to physiologic teaching, but experience indicates that following procaine injection, epinephrine can supply the spark which starts the beat after the next shock. If the heart still does not start, massage is continued and shock repeated.

If the heart beat is not restored after three attempts the following possibilities must be considered: anoxia of the cardiac muscle, retention of carbon dioxide, the procaine effect, the epinephrine effect, and intrinsic heart disease. Anoxia and carbon dioxide retention can be best overcome by the use of a mechanical respirator (Drinker respirator). Balance between the amount and sequence of procaine and epinephrine must be struck. Beck repeatedly emphasizes and has proved, both clinically and experimentally, that the normal heart can be defibrillated and a coordinated beat restored, even after a long period. But the oxygen system must be restored without delay.

Closing the Chest.—This technic is routine and offers no difficulty to any surgeon. The usual supportive measures are instituted—intravenous fluids, to which epinephrine can be added as blood pressure levels drop; an intratracheal tube in situ, with mechanical respiration continued until the patient is able to maintain his own respiration.

Beck classifies the results following resuscitation in five categories:

(a) Complete recovery of respiratory, cardiac, and cerebral functions

(b) Recovery of respiration and heartbeat, with delayed recovery of cerebral function

(c) Recovery, except for permanent impairment of cerebral functions

(d) Recovery of heartbeat with failure to maintain respiration without mechanical aid

(e) Temporary recovery of heartbeat but gradual decrease of blood pressure resulting in death.

SUMMARY AND CONCLUSIONS

1. An exposition of the Beck technic for the treatment of cardiac arrest occurring in the operating room has been presented.

2. Success of the method depends upon the coordination of the resuscitation team composed of the anesthesiologist and the surgeon, conditioned by drills in the simple but precise technics.

3. Restoration of the oxygen system is the primary requisite, and must be accomplished in 3 to 5 minutes or cerebral damage will occur. Restoration of the heartbeat can be accomplished in minutes or hours after the oxygen system has been restored.

4. Practice drills on dogs have been proved of great practical value by the courses offered under the auspices of the American Heart Society.

5. Certain minimal equipment and an emergency packet should be a part of every operating room set-up.

662 Hanna Bldg.

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THE THYROID AND THE NOSE

For several decades rhinologists and endocrinologists have been aware of a relation between thyroid deficiency and nasal disease. That the connection between the thyroid gland and the nasal cavity is real and not merely fortuitous has been confirmed on a number of occasions by various investigators. Recently Proetz, impressed by the frequency with which hypothyroidism suggested itself as a causative factor in nasal disease and headache, described his experiences with 130 patients, all of whom were selected for study because the diagnosis of hypothyroidism was reasonably certain, confusing complications did not exist, and response to thyroid extract therapy was demonstrable. . . . A characteristic feature was the inability of the nasal cavity to respond to conventional therapy. Contrariwise, a high percentage of the patients evinced striking clinical improvement after treatment with thyroid extract; moreover, when this was withdrawn, the offending nasal symptoms recurred.—Editorial, *Journal of the American Medical Association*, June 14, 1952.

Health and the Biped Stance

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Many of the health problems which confront mankind today stem directly from his inadequate adaptation to the erect posture. Fundamentally, man possesses the anatomic structure of a quadruped, but his vertical stance imposes innumerable stresses and strains on his structure in addition to exaggerated gravitational effects to which the quadruped is not subject and for which man is not yet biologically prepared. In recognition of the importance of these evolutionary problems, two articles have recently appeared which also bear important relationships to the osteopathic concept and merit the attention of all physicians. In an article entitled "The Scars of Human Evolution," by Wilton M. Krogman,[1] attention is called to the inadequacy of the mammalian musculoskeletal structure to the upright posture; the other article, "The Pathologic Physiology of the Upright Posture," by Frederick C. Lendrum,[2] emphasizes the exaggerated gravitational effects upon the various organ systems imposed by the vertical position, in addition to skeletal or structural inadequacies. It is the purpose of this paper to present an integrated review of these two important articles in the light of osteopathic thought.

First, consideration may be given to some of the problems that the biped stance creates and to evaluation of the adaptive steps that man has made to them. Gregory[3] has likened the skeletal system of a quadruped to a cantilever bridge, pointing out the resemblance of the spine to an arched cantilever supported by the four limbs, with the weight of the trunk and abdomen suspended from the weight-balanced vertebral arch. However, when man assumed the biped posture the advantages of the cantilever system were lost and the vertebral column was compelled to adapt itself to the new and unaccustomed stresses and strains of weight-bearing in the erect position. It is interesting to note that the spine of the human infant exhibits the same single arched curve or "cantilever" as that of the mammalian adult quadruped; and it is only when the child begins to hold up his head, to stand, and to walk that the secondary cervical and lumbar spinal curves develop, resulting in the S-shaped vertebral column characteristic of modern man. With this development originate many of the ills and problems that plague him throughout his life.

Further examination of the spine reveals that the vertebral bodies have become wedge-shaped, that is, thicker anteriorly than posteriorly. As Krogman points out, ". . . this allows the vertebrae to pivot on their front ends as on hinges, like the segments of a toy snake. On the other hand, it also weakens the backbone, particularly in the lower back region, where the wedge is most pronounced." Therefore, in order to maintain spinal stability with the vertebral column in the vertical position, while still allowing for mobility, we have become dependent upon the actions and interactions of scores of muscles. The musculoskeletal system has been forced to assume a "job" for which it was not originally intended and one to which it is not mechanically well adapted from a strictly engineering viewpoint. Thus have originated numerous and frequent structural problems. The lumbosacral area becomes a potential area of strain, because of its inherent structural weakness, each time we stoop over or lift something heavy. It is no mere coincidence that acute structural lesions and herniated vertebral disks are so often located in this area, or that "low-back" ache and pain are among the complaints most frequently presented to the physician today.

On assumption of the erect posture the pelvis was forced to become a weight-bearing structure—something for which it was never designed anatomically. For this purpose it has assumed new positional relationships. It has been tilted upward so that it is no longer parallel with the spine as in the quadruped. The pubes have assumed an anterior instead of an inferior position; the ilia have become flattened to form the crests of the hips and to help support the pelvic and abdominal viscera, while the ischia must now bear the brunt of weight in the sedentary position. The sacrum has been forced downward between the ilia resulting in an unstable relationship from which arise the innumerable sacroiliac "problems" so familiar to osteopathic physicians. Furthermore, sacral encroachment on the size of the pelvic cavity, with narrowing of the birth canal, lays the foundation for many obstetrical delivery problems. The burden of weight-bearing on the pelvis during childhood growth, before ossification of the bones, likewise results in numerous pelvic deformities; not to mention the conduciveness of the erect posture, with its exaggerated gravitational stresses, to prolapse and retroversion of the uterus, dysmenorrhea, and other gynecologic disturbances.

The cardiovascular system has been placed under an especially great handicap by our biped stance. It has been forced to adapt itself to maintaining an adequate circulation in both the erect and supine positions complicated by the fact that we often change from one to the other in a moment's time. Or, as Lendrum[2] so aptly states, "A man may be regarded as an erratic skyscraper which lies on its side until the alarm clock rings in the morning, and then abruptly stands upright. If there is any failure in the intricate automatic adjustment to this sudden change, the most sensitive organ, the brain (which unfortunately occupies the top floor of our metaphorical skyscraper) is deprived of needed blood supply." Furthermore, the cerebral circulation must be maintained without the benefit of valves in the great veins of the head. How to overcome this anatomic problem and maintain an adequate cerebral blood supply at high speed aeronautical maneuvers and thus prevent "blackouts" has resulted in much research and experimentation in modern aviation in this "jet-propelled" era.

On the other hand, the gravitational pull on the venous columns of the lower extremities, increased by the hydrostatic pressure of the veins of the head, neck, and trunk, must not only be overcome by the heart,

but predisposes the valves and walls of the veins to incompetency and stretching and often results in varicose veins. Similar anatomic circumstances with respect to the portal circulation, which not only lacks valves but serves as a connection between two capillary systems, makes it especially vulnerable to back pressure and the production of varicosities in the rectal veins, or hemorrhoids.

Examination of the respiratory system reveals that all drainage of the bronchial tree must be upward against the pull of gravity; hence we must depend upon the action of the ciliated epithelium, coughing, deep breathing, or the muscular action of the bronchioles for bronchial drainage. Pulmonary aeration has been further hampered by the additional effort required for expansion of the thoracic cage because of the more acute costovertebral angulation in man than in the quadruped. The frequency of hypostatic and regurgitation pneumonias as the ultimate cause of death in many gravely ill patients is not without a logical explanation. Similarly, the annoying condition of sinusitis, endured by so large a proportion of today's population, is undoubtedly related to the fact that in the erect position the orifices of the paranasal sinuses are so positioned as to make drainage by gravity virtually impossible; each pair requires a different position to effect drainage.

An area of muscular weakness imposed by the erect posture is the abdominal wall, and more specifically, the lower quadrants. In quadrupeds the weight of the intestinal tract and abdominal viscera is distributed along the vertebral arch by their mesenteric attachments; but in the standing posture the viscera tend to sag downward into the "pelvic bowl," predisposing to intestinal stasis, constipation, visceroptosis, venous congestion, pendulous abdomen, severe strain on the lower abdominal walls, and the development of hernias.

One might continue enumerating conditions with which the role of the erect posture, with its attendant exaggerated gravitational stresses, must be associated. Even the feet must bear a greater weight burden in the biped than in the quadruped, a fact that must be related to flat feet, fallen arches, and other foot ailments. The biped posture must also play some part in edema, ascites, peripheral vascular disturbances, vascular diseases, and many other syndromes in the long and varied list of ailments which Lendrum[2] has so appropriately called the "diseases of the upright posture."

The relationship of the osteopathic concept to these syndromes resulting from man's inadequate structural adaptation becomes at once self-evident. In identifying the role of osteopathy in the healing arts, Korr[4] has stated that "the central contribution made by the osteopathic concept to the biological sciences—the one from which the others flow—lies in the recognition of the unity of the body. More specifically, it lies in the recognition of the complete unity of the body, with full reciprocity in the interrelationships among all the organ systems—including the musculoskeletal system. Although the principle of the unity of the body has long been accepted by biological scientists, the musculo-skeletal system, with its investing structures, has not, even in modern biological thought, achieved adequate reciprocity in its relationships with other systems. It is still viewed only as the instrument of other systems, subject to their influences and instigations—but rarely itself an instigator. The osteopathic concept for the first time assigned to this system full and reciprocal membership in the community of organ systems."

Changes in somatic structures, such as muscular rigidity, pain, tenderness, et cetera, resulting from visceral pathology, have been observed and recognized for many years, as indicated from the statement above. Mackenzie[5] in the latter part of the last century observed the presence of tenderness of the vertebral spines in specific areas associated with certain disease processes in patients. But it remained for Still[6] to express the concept that structural changes in the musculoskeletal system might also bear an etiologic relationship to disturbed visceral function or disease. Therefore, a relationship may be clearly established between the stresses and strains on the musculoskeletal system incurred as the result of man's inadequate evolutionary adaptation to the erect posture and the dysfunction or disease of the other organ systems. For, although a complete and exact understanding and evaluation of the effects of a spinal stress on physiologic mechanisms responsible for the organization of the disease process await, even today, further intensive research and study, Thomas,[7] Korr,[8] Denslow,[9] and others have shown the existence of a relationship between structural deviation and altered functioning of the autonomic nervous system as one of the probable important mechanisms responsible in many disease syndromes.

Recognition of the specific problems originating from the exaggerated effects of gravity because of the upright posture on the cardiovascular, lymphatic, cerebrospinal, genitourinary, pulmonary, gastrointestinal, and other organ systems have also always been a part of osteopathic thought and practice. The very early origins of osteopathy, as conceived by Still, recognized the necessity and importance of the adequacy and efficiency of the arterial, venous, and lymphatic circulations. Therapeutic procedures were devised and have long been utilized to improve circulatory deficiencies, enhance lymphatic drainage, increase pulmonary ventilation, et cetera, thus mitigating the adverse effects of gravity in many instances. Manipulative procedures have been devised to correct or aid in alleviating the malpositioning of abdominal and pelvic viscera, particularly in the correction of uterine displacements, dysmenorrhea, intestinal stasis, visceroptosis, venous congestion, and similar conditions, all of which, as previously mentioned, are related to the effects of gravity in the bipedal posture. Further study and recognition of the relationship of the role of gravity with respect to posture, especially on the cardiovascular, lymphatic, and cerebrospinal systems will undoubtedly bring a better understanding of such clinical syndromes as edema, hypertension, peripheral vascular disease, headache, and arteriosclerosis.

Finally, there is another corollary to man's erect stance. The upright position liberated his hands. With the development of manual dexterity came the rapid development of the brain and cerebral cortex. The combination of these processes has provided all the material achievements and complexities which modern society enjoys. But not without a price, for with cortical development, psychic influences have been superimposed upon somatic problems creating even greater problems of which our understanding is as yet only fragmentary.

Thus it is seen that because of the erect stance the effects of gravity on the bodily systems are greatly exaggerated. Man is therefore subject to stresses that

are not important to the mammalian quadruped and for which he is as yet biologically unprepared. The influence of these stresses, in conjunction with those that have arisen from the human brain, upon the health of man is in need of intensive study and investigation. Within the understanding of these stresses and in the evolvement of corrective and preventive measures lie the foundations for the relief and eradication of many of our health problems. Toward these objectives osteopathy has already made significant contributions, and through research it promises to make even greater contributions in the future.

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Association of Cervical Joint Derangement with Painful Shoulder

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The purpose of this paper is to suggest a single basic cause for breakdown of the shoulder mechanism and to point out that such conditions as subacromial bursitis, supraspinatus and bicipital tendinitis, frozen shoulder, periarticular adhesive capsulitis, and similar conditions all have their starting point and basic pathology in a lesion between the fifth and sixth cervical vertebrae.

Functionally, movement of the shoulder involves four joints: (1) the scapulohumeral, (2) the sternoclavicular, (3) the acromioclavicular, and (4) the scapulothoracic. The movement is obviously an extremely complex one, but depends fundamentally on what has been called the "muscle force couple." This couple is composed of two sets of muscles: first, those responsible for abduction, represented mainly by the deltoid; and second, the muscles which stabilize the head of the humerus in the glenoid fossa, namely the infraspinatus, teres minor, and subscapularis. Any lesion which impairs the function of this second group and interferes with the downward pull of these muscles will allow the humeral head to ride upward on abduction so that the space between the acromion process and the humeral head is reduced. Reduction of the interval between the acromion and the head of the humerus will result in pressure on such structures as the subacromial bursa, the supraspinatus tendon, the biceps tendon, and the capsule of the glenohumeral joint. Constantly recurring nipping of one or several of these structures on abduction of the shoulder will in time produce painful inflammatory reactions and limitation of shoulder movements.

It is suggested that pressure on the sixth cervical nerve will so impair the action of the subscapularis muscle as to reduce the power of the downward component of the shoulder couple and thereby allow the deltoid to pull the head of the humerus upward in the glenoid fossa. The common causes of pressure on the sixth cervical nerve are:

1. Herniation of the intervertebral disk between the fifth and sixth cervical vertebrae

2. Synovitis of the neurocentral joint between the fifth and sixth cervical vertebrae

3. Encroachment of osteophytes on the neural canal between the fifth and sixth cervical vertebrae as a result of osteoarthritis of the neurocentral joint.

It is significant that of all the joints in the neck, that between the fifth and sixth cervical vertebrae is the one which commonly shows the above pathologic changes. This joint is the most vulnerable because of its position at the point of maximum normal cervical lordosis, causing it to bear the brunt of any trauma to the neck. It need not be pointed out that the fifth and sixth are the two vertebrae most commonly involved in a crush fracture of the body of cervical vertebrae; it is accordingly reasonable to assume that this area is more prone to injury than the rest of the neck.

The following train of events is envisaged. Trauma, either single or multiple, will result in degenerative changes between the fifth and sixth cervical vertebrae, and these changes, in turn, produce either pressure on, or distraction of, the sixth cervical nerve root. It has been demonstrated by electromyography that when there is pressure on a nerve, the muscle supplied by that nerve fails to contract normally and indeed may show weakness amounting almost to paralysis. The parts of the subscapularis and infraspinatus muscles which are supplied by the sixth cervical nerve begin to fail in their function of holding down the head of the humerus in the glenoid fossa, and the stage is set for a reduction in the acromiohumeral space and resultant nipping of the intervening structures. The patient complains of pain, weakness, or limitation of movement of the shoulder. He may or may not show well marked signs of root pressure, such as areas of altered sensation, corresponding to Kellgren's[1] chart of segmental distribution of deep pain, altered tendon responses, or weakness of certain muscles. However, he will invariably show an altered scapulothoracic rhythm on abduction. This altered scapulothoracic rhythm manifests itself as a slight bunching of the shoulder muscles or a pronounced hitch on abduction, but may, if severe, produce com-

plete locking—the so-called frozen shoulder. Palpable tension and tenderness in the spinal muscles will be elicited, guarding articulation between the fifth and sixth cervical vertebrae. An x-ray of the cervical spine, including oblique views, will often reveal a reduced disk space and encroachment of osteophytes on the neural canal. A significant radiologic finding on the lateral view in young people is a localized flattening of the normal cervical lordosis, confined to the fifth and sixth cervical vertebrae. Lateral views of the neck in full flexion and full extension will often show that the fifth and sixth cervical fail to follow the rhythm of the other cervical vertebrae. These exposures are not routinely necessary. The presence or absence on the x-ray of an area of amorphous calcification in the supraspinatus tendon or one of the bursae in no way influences the prognosis; spontaneous absorption of these areas occurs at a rate equal to restoration of normal shoulder rhythm.

It is hardly necessary in THE JOURNAL, to point out that the treatment of choice is osteopathic manipulation of the vertebral joint in an attempt to free the involved nerve root. The manipulation should be specifically planned to gap the joint on the involved side and by restoring joint play release the muscle spasm guarding the cervical articulation. Manual traction alone will often be helpful in opening up the neural canal. Sometimes a plaster collar is indicated in order to immobilize and splint the cervical spine, when the underlying pathologic process is one of synovitis of the neurocentral joint. The amount of shoulder abduction should be measured accurately and recorded in degrees before and after treatment. If abduction is increased by 10 degrees after manipulation, a favorable prognosis can be given. Many times the range of abduction is dramatically restored to normal after a single manipulation.

Attempts to mobilize the shoulder at this stage by passive manipulation will not only prove futile but, by nipping the structures in the acromiohumeral space, may do harm. In a case of long standing, it may be necessary to break down adhesions in the glenohumeral joint under anesthesia, but this should only be done some weeks after the cervical spine has been dealt with. In practice it will be found that most patients will gradually break down their own adhesions once the shoulder couple has been restored. If manipulation of the shoulder under anesthesia is decided on, rotation must be restored before any attempt is made at forceful abduction. It is my opinion that manipulation of the cervical spine under anesthesia is to be avoided. Even in skilled hands a disk herniation that presses on the pyramidal tracts can easily occur.

It is my belief that the cause of many breakdowns of the shoulder joint is to be found in the cervical spinal joints and that it behooves the osteopathic physician to find the cause, fix it, and leave it alone. This advice of Andrew Taylor Still seems to me to suit my hypothesis well. It is also germane to my argument to eschew false prophets who would have us remove the acromion process in order to release pressure on the structures in the acromiohumeral space. A diagnosis of supraspinatus tendinitis goes only half way in describing the pathology of painful shoulder.

SUMMARY

In the writer's experience:

1. The commonest basic cause for breakdown in the shoulder mechanism is a lesion between the fifth and sixth cervical vertebrae.

2. Such a lesion, by pressing on the sixth cervical root, will upset the downward component of the "shoulder muscle couple," and, by allowing the head of the humerus to rise in the glenoid fossa, produce nipping of the structures in the acromiohumeral space.

3. The treatment of choice is osteopathic manipulation of the cervical spine to free the nerve root.

4. Andrew Taylor Still's advice to trace the pathology to the spine, then fix it, and leave it alone is as sound today as it was 75 years ago.

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PSYCHOLOGICAL PROBLEMS OF AGING

Aging is a universal, continuous and insidious process, beginning with conception and ending with death. What is understood as "old age" or "growing old," in terms of structure and function, may be observed in one person in his earlier years, and in another many years later; or it may manifest itself locally in special organs such as the heart, kidneys, brain, eyes, ears, or skin, in an extremely irregular and variable fashion. Growth and repair, atrophy and deterioration, are constantly in evidence at any age level and differ in intensity and rate from one person to another so that it becomes most important always to consider biological as well as chronological age. Some persons are old and worn out in adolescence, while others may be old in years and still quite active and useful. Age should, therefore, be considered in terms of structural, physiological, behavioral, intellectual, and emotional factors, and only then can judgments be made of true biological age in contrast to chronolgical age.—Alexander Simon, M.D., *California Medicine*, August 1951.

The Cardiac Management of the Surgical Patient*

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When surgery is contemplated the problem confronting the internist is the consideration of the patient's history and presenting *symptoms* and/or findings indicative of disturbed cardiac function. Immediately when such a problem must be evaluated it becomes threefold in nature. The need is for a team composed of the internist, the anesthetist, and the surgeon working in unison to afford the patient the best prognosis. Each doctor has his own individual function to perform but complete cooperation is essential to give the patient the very best care. The role of the internist in particular has many ramifications.

First it becomes imperative that the internist give his aid in determining whether the problem is definitely a surgical one or whether the picture presented is due to the cardiac disorder itself. Many cardiac affections present features which make them similar to, and confused with, acute surgical abdominal emergencies. Mention should be made of a few of the most common of these conditions which may complicate the picture. Acute coronary thrombosis may well present a picture mistaken for acute renal colic, acute gallstone colic, perforated peptic ulcer, or acute pancreatitis. Pericarditis or pneumonia in children may simulate acute appendicitis. Acute rheumatic fever may be mistaken for an attack of cholecystitis. There is no specific test for either condition and at times it may be advisable and necessary to perform an abdominal exploration to be sure of the diagnosis. As Levine[1] has said, ". . . it is safer to find an occasional normal appendix than to overlook appendicitis that develops into a fatal peritonitis." At times it may be most important for the internist to use his best diagnostic acumen to detect the etiology of an acute abdominal emergency arising because of an embolism to one of the abdominal viscera. Frequently the cause may be a cardiac difficulty such as mitral stenosis, auricular fibrillation, and, at times, subacute bacterial endocarditis. The importance of an accurate diagnosis in such individuals becomes paramount.

Secondly, it is the duty and responsibility of the internist to determine whether the prognosis of the cardiac condition is good enough to subject the patient to major surgery. In such cases a determination must be made as to whether the life expectancy of the particular patient suffering from heart disease warrants undertaking the contemplated surgery. Only in the most urgent cases should one consider doing major surgery on patients with advanced heart disease.

A third consideration which is of very great importance has recently been given unusual stress; that is, the insistence that the internist, the anesthesiologist, and the surgeon be familiar with the operative mortality in various cardiac disorders. Later in this paper I will give some conclusions that were reached because of Levine's[1] intensive review of 414 cases subject to 494 major operations.

The role of the anesthesiologist ties in very closely with that of the internist and if the anesthesiologist is to do his best he must acquaint himself thoroughly with the cardiac status, the over-all physiologic state, and particularly the cardiac reserve of the individual patient.

With this information obtained in conjunction with the internist, the next step is for the surgeon to familiarize himself with the condition of the patient and to aid in the plan of procedure. The surgeon certainly is not directly responsible for the treatment of the cardiac pathology or for the management of the patient during the administration of the anesthetic but within his province lies the task of minimizing surgical shock. He must recognize the necessity of working with gentleness and caution so as not to add to the strain of the heart. In this respect the surgeon must hold the blood loss to an absolute minimum. He must avoid unnecessary traction and visceral stimulation and he should be skilled in the use of local anesthesia as a supplement when indicated. It has been said that the surgeon and anesthesiologist should work in close cooperation so that they are working for the welfare of the patient whose prognosis is directly proportionate to the understanding each has for the other's tasks and difficulties.

A presurgical study or evaluation of the patient must be conducted in order to arrive at a conclusion as to whether the patient is a good or a poor surgical risk. There is a quotation by Lord Moynihan that is most pertinent in this respect. "Surgery has been made safe for the patient. We must now make the patient safe for surgery."[2]

To evaluate properly the heart in relation to surgery a searching and systematic history must be obtained. First, a detailed account of the patient's present illness should be secured, including the onset of the symptoms and any antecedent factors that may have caused a predisposition to the present illness, taking into consideration the patient's previous health. This latter determination is particularly pertinent to and important in determining the amount of cardiac reserve the patient may have. In this respect it is not enough to diagnose qualitatively, as it were, the lesion from which he suffers. It is necessary to determine the extent and the damage that may have been brought about by perversion of normal function. The more complete the picture both clinically and from the standpoint of pathologic physiology, the greater the probability of averting operative complications.

Next, the present complaint which seems to require surgery must be considered. A study of the symptoms should be made to determine whether they are functional or organic. It has been estimated that essentially 85 per cent of all cases presented for general surgery may have symptoms that call for careful preoperative consideration. Relatively few of these have organic difficulties. All cardiac disease entails extra-surgical risk. However, patients with cardiac conditions that have been and are fully compensated present only about 5 per cent increased risk. The reason patients with organic heart disease entail extra risk is that cardiac functional reserve is diminished. As a rule, however, patients with heart disease stand surgical procedures fairly satisfactorily when handled by a

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team such as I have outlined. A study of the physical findings will make it possible to present a worth-while prognosis.

Mention should be made first of some conditions affecting all patients when surgery becomes necessary and especially the patient who may have some cardiac pathology. Surgical manipulation of an infected area, as in oral sepsis, may precipitate subacute bacterial endocarditis in patients with valvular or congenital heart disease. Respiratory infections, active or subsiding, may contribute to difficulties; marked dehydration may do likewise. Obesity is a factor to be considered. In obese patients one must search for diabetes mellitus, hypothyroidism, arteriosclerosis, hypertension, renal damage, avitaminosis, and, last but not least, anemia which may be a very important factor. The aged and cachectic not only tolerate surgery poorly but also tolerate preoperative medication poorly. However, in the appraisal of any patient and particularly the aged, the patient's physiologic rather than chronologic age is the important consideration. Thyrocardiac patients withstand operation surprisingly well if they are properly prepared.

The arrhythmias have always been a most disturbing factor. In general, the condition of the myocardium rather than arrhythmia is the prime factor. Myocardial damage is indicated in the presence of a heart showing the strain pattern, gallop rhythm, pulsus alternans or bigeminus, ventricular tachycardia, or any type of heart block. One or a combination of these findings should serve as a sign of increased risk. According to Levine[1] those cardiac disorders causing the highest mortality during and following surgery are coronary thrombosis, heart disease with nephritis, congestive heart failure, and angina pectoris. I believe that cardiologists generally are in accord with these conclusions. Ovid O. Meyer[3] stated ". . . it is the ability to withstand the stress and strain of daily life, the carrying on of one's occupation, walking and stair climbing, and other mental and physical activities that are the most helpful evidence of the heart's functional condition."

Next we come to consideration of the anesthesiologist and the anesthetic. It goes without saying that the anesthetist must be skilled—familiar with the management of the anesthetic. The induction of the anesthesia must be relatively rapid so that excitement and struggling may be kept at a minimum. Adequate oxygenation must be maintained and the elimination of carbon dioxide must be managed in an efficient manner. It would seem, certainly, that it is the anesthetist and not the anesthetic that is most important. However, there are some types of anesthetics that are more applicable to certain cardiac conditions. In this respect some generalization regarding anesthetics may be in order.

Chloroform, for instance, is extremely toxic to the circulatory system. Ethyl chloride is essentially as toxic as chloroform. Vinyl ether is less toxic to the circulatory system but is quite toxic to the liver. Nitrous oxide tends to cause quick asphyxia; thus the cardiac, particularly the arteriosclerotic group and nervous individuals may be adversely affected. Cyclopropane slows the heart; thus the conduction mechanism may be affected. Any cardiac irregularity may be aggravated by cyclopropane. Avertin depresses the respiration and tends to lower the blood pressure. In those patients with severe organic cardiac disease, other things being equal, local or regional anesthesia is preferable to general anesthesia. Local or regional anesthesia used in conjunction with the judicious administration of sedatives and narcotics, and, at times, a small amount of nitrous oxide oxygen, provided the oxygen is not reduced below 20 per cent, makes for better anesthesia. Low spinal anesthesia for operations below the abdomen is also fairly safe. Frequently of course the type and extent of the operation or the apprehension of the patient makes a general anesthetic the most desirable. If the anesthetist is inexperienced, ether is the preferred anesthetic. One can again add the note that it is the skill of the anesthetist that seems to be of primary importance.

Surgery having been decided upon, some phases of preoperative management require attention. Cardiac arrhythmias have always given physicians much concern. Recently Pronestyl (procaine amide) has been available for both intravenous and oral use. Although this drug is a myocardial depressant it has a great deal of "safety factor" and is most useful in supraventricular tachycardias. Quinidine is becoming increasingly popular. It has been used, notably by Tovell and Steven[4] 24 hours preoperatively and followed by a dose 1 hour prior to the anesthetic. It is chiefly beneficial for ventricular tachycardia and some cases of auricular fibrillation. Auricular or ventricular flutter may respond rather readily to quinidine. However, because quinidine sulfate may render a susceptible heart more irritable, thus predisposing it to ventricular fibrillation, its use should be undertaken cautiously.

Blood volume is another preoperative consideration. Many chronically ill patients with normal hematocrit values have diminished cell volume. Adequate oxygenation is entirely lacking and they may be said to be in a form of "chronic shock." Fluid administration utilizing whole blood, blood plasma, dextrose, and isotonic sodium chloride will often prevent shock or combat it once it is established. However, the system must never be overloaded with fluid. Serious sequelae such as pulmonary edema or acute cardiac decompensation may result.

Patients presenting any break in cardiac compensation should have compensation restored before coming to surgery. This may mean complete digitalization with the establishment of a definite maintenance dosage.

As osteopathic physicians we will be concerned with detailed spinal evaluation of the preoperative patient. As we all know, important information may be gleaned by a study of the soft tissue state. Interference with lymphatic drainage is readily discerned and readily facilitated by osteopathic manipulative measures. Tensions from the slightest to the most marked may be determined by skillful palpation. Osteopathic segmental lesions should be detected; they will be invaluable in the diagnosis of the patient's condition. Correction of lesions in some instances has precluded the necessity of surgical measures. Again, correction of osteopathic spinal lesions may make the patient safer for necessary surgery. Postoperatively, osteopathic manipulative care in many, if not most, cases not only aids materially in making convalescence easier but also promotes the healing process.

As osteopathic physicians and surgeons the important thing is to keep in mind, first, that definite bony lesions exist which disturb function; second, that function is primarily disturbed by the effect of the

(Continued on page 563.)

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MEDICINE AND THE BOYCOTT

In early June, 1952, a local controversy, between osteopathic physicians and doctors of medicine in Bay City, Michigan, over hospital use developed news interest to the degree that the problem was aired nation-wide through the Associated Press. But "the battle," as it was termed by journalists, has more than its sensational aspects. The controversy has involved ethical and moral values that are age-old.

The immediate issue is a sore point to the osteopathic profession. Bay City General Hospital is a municipal institution, considered as a department of the city under the supervision and control of the City Commission. Early in 1952 City Attorney Bernard A. Frasik ruled that the General Hospital was a public supported institution and that osteopathic physicians could not be excluded from the use of its facilities. Frasik stated that the problem might not be harmonized without court action. He advised the Commission if osteopathic physicians were excluded it would be with the idea that they could press for legal determination, implying that might be the most effective way to settle the problem.

The City Commission, however, resolved that the public welfare could best be served if each professional group would appoint a committee and by interprofessional means attempt to reach an agreement in the dispute. The Commission warned in the event of non-agreement, it had no legal grounds to bar osteopathic physicians from the hospital. The Bay County Association of Osteopathic Physicians and Surgeons by resolution requested the city commissioners to turn over a section of the General Hospital for their exclusive use. Hobert C. Moore, D.O., First Vice President of the American Osteopathic Association, was the spokesman for the local osteopathic association. Dr. Moore stated that the osteopathic group could operate such a section of the General Hospital with a profit to the hospital and in the interest of a concerned citizenry. City manager, George MacPhail, the administrator for the City Commission, claimed that admission of osteopathic physicians under any plan would cause "irreparable damage" to the hospital and result in "serious consequences."

Early in the controversy it became apparent that the Bay County Medical Society had no intention of attempting any solution through a joint committee study. The position of the local M.D.'s strictly precluded any attempt at interprofessional agreement, as requested by the city commissioners. Almost immediately the Medical Society threatened to boycott General Hospital if the Commission voted not to exclude osteopathic physicians and surgeons, and emphasized that the seventy-member medical staff would resign en masse.

After 3 months the controversy reached an impasse. On June 10 the City Commission voted 5 to 4 to authorize the use of General Hospital by the osteopathic group. Doctors of medicine put their threat into execution, by starting a boycott of the institution. They discharged their patients or removed them to Mercy Hospital, a 200 bed semipublic institution. No new admissions were made to the General Hospital by M.D.'s. The technical and nursing staff, however, for the most part remained. Immediately the Michigan Osteopathic Hospital Association rallied its forces and proceeded to form an emergency twenty-five-man staff to render needed professional service at the municipally owned institution. The rapidity with which organized osteopathy in Michigan met the situation is in itself ample evidence of the professional strength of osteopathy in that state.

But the force of superior numbers triumphed. On June 16 the city commissioners rescinded their earlier decision to open the municipal hospital to patients of osteopathic physicians and by a reversed voting ratio closed the hospital to osteopathic patients.

At the same time that this crisis at Bay City was in progress, the American Medical Association was holding its 101st annual meeting in Chicago. With no direct relation to the local problem in Michigan, and probably largely unaware of it, it is reported in the press that the House of Delegates of the A.M.A. moved that a committee should be named from their Board of Trustees to work with a committee from the A.O.A. on the problems of medical education as they relate to osteopathic colleges. The action of the A.M.A. House of Delegates, however, highlighted the Michigan controversy, revealing that it possessed an import greater than that of a sensational battle between local factions. Newspaper reporters at the Chicago meeting were quick to pick up an apparent defection at a high level in A.M.A. ranks. A.M.A. officialdom was questioned on the possibility of an apparently new A.M.A. policy and its relationship to the Michigan fight. Their spokesman advised a leading Chicago newspaper that organized medicine at the national level had no policy on osteopathic physicians and that all such problems as the one in Bay City could only be "handled strictly by local societies."

The action of the House of Delegates relating to the osteopathic profession, while coincidental, made evident the fact that the Michigan episode involved more than local issues, more perhaps than was recognized by the participants themselves.

The significance of the Bay City fracas goes beyond that of justice to osteopathic physicians and their right to serve the public in a public institution, and it over-reaches those self-annointed and self-appointed guardians of the public health of Bay City, the local medical society. The significance lies in the duty which each group owes to the public welfare of the *entire* community, irrespective of sectarian differences and partisan claims. Bay City properly made the headlines, not because a "war" was on and war is always news, but because there are present in this issue values beyond medicine itself, values that lie in the realm of moral philosophy and ethics. The concrete issue centering around the use of the Bay City General Hospital is in a world of relatively ponderable facts and necessarily must be settled upon that basis. But neither of the parties to the controversy dares ignore the fact that any action taken ultimately ends within the world of the imponderables.

Newspaper coverage in Bay City has been factual, objective, and accurately analytical. Editors sensed that the issues being debated were beyond men or groups of men. The *Detroit Times* for June 16, 1952, analyzed the situation for its readers in an editorial which administered a stinging rebuke to those who were responsible for the strike against public welfare.

> The Bay City General Hospital is a publicly-owned institution. Regardless of merits of the battle between them, osteopaths have the same licensed rights as healers by state law, as have the doctors of medicine. Legally, they have the right to practice in a public hospital.
>
> Neither a doctor of medicine nor his patient is harmed the least because a doctor of osteopathy may be treating a patient in the next room.
>
> Those who most vehemently have protested attempts to legislate against doctors now find doctors attempting to suppress osteopaths.
>
> The cause of medicine is not, we fear, being advanced by the Bay City boycott.

Even more, the age-old heritage of medicine was endangered by the precipitate action of a responsible organization. In a foreword to "The Ethical Base of Medical Practice," J. Howard Means, Jackson Professor of Clinical Medicine, Harvard Medical School, points out the doctor may be worthy of praise individually, "but when he organizes he falls far short of it." In this day of increasing organizational power and decreasing individual influence, this truism may present a dangerous dilemma for medicine. It has never been better illustrated than by the Bay City incident.

As a result we must give consideration to a newer line of development. Henry Sigerist, in his "Medicine and Human Welfare," says "Medicine was originally a private relationship between physician and patient. What happened between the two did not concern anybody else." The increasing interrelationship between physicians and patients on one hand and society on the other is almost transforming medicine into a social institution in which the responsibility of doctor and patient alike to society is becoming a matter of primary concern and medicine is moving more and more into a position of total responsibility to the people. The medical practice of tomorrow will be organized around a health center, where disease can be checked before it strikes. On this basis, Sigerist has pointed out, medicine like education will ultimately become a public service, although a service which does not necessarily involve the present bogy of "socialized medicine."

The problem at Bay City developed to such a degree that little cognizance was taken of medicine's first responsibility, its duty to the public. Light was not engendered by the controversy, only heat. Organized medicine as represented by the Bay County Medical Society elected to strike against the public interest. It refused arbitration and applied coercive measures to the degree that the public health was endangered.

The same situation can arise again, under other circumstances, but presenting the same problem. Osteopathy has become much more than a minority school in medicine. It has become the second majority school. No such action as evinced at Bay City will ultimately prevent this responsible section of American medicine from fulfilling its duty to the public. Any group or groups that see the problem otherwise have not been kept informed. It is no longer a question of whether or not they like it, as individuals or as a group. It is a question of reality.

A spokesman for the A.M.A. dismissed the problem as one over which it had no control, stating that such a problem must be solved at the local level. That is true. It is equally true that the American Osteopathic Association could not directly intervene in this matter.

Organized medicine, however, be it allopathic or osteopathic cannot so readily escape responsibility upon a high level. Its responsibility is to guide, advise, temper, and forestall. Removed, as both organizations are, from the immediacy of any specific problem, both are in a position for a judicious leadership in which the public responsibility of medicine is placed foremost in the minds of the members. It is not too much to expect national organization to work together in fields of mutual responsibility. If they do not, judgment will be upon them and the public will be caught between what to it is a sectarian controversy. This it will not condone.

The American people will look to organized medicine represented by the A.M.A. and the A.O.A. for a leadership that will forestall future strikes against human welfare. Neither organization has a problem that concerns both that is so paramount as this. Truly, "The cause of medicine [was not] advanced by the Bay City boycott." Medical organizations can justify their existence only to the degree that they do advance the cause of good medical care. But the American public must be convinced that both organizations are dedicated to that effort.

In its Constitution the American Osteopathic Association states as its primary object promotion of

the public health. Community after community, nationwide, look to the osteopathic profession for a medical care that does not place selfish interest and sectarian adherence first. Again, organized osteopathy pledges its membership to a cooperative effort with any other group so dedicated.

OSTEOPATHIC RESEARCH—ITS SCOPE

There are two methods to pursue in developing a service to one's fellows. One may pursue the course inherent in the phrase "By their works ye shall know them," which, while empiric, has much to commend it, or one may follow the path of reason and seek to justify one's actions. The learned professions have generally elected the latter while the arts have relied on the former. Medicine is on the horns of a dilemma and tries to keep astride the fence. But having chosen to be rational while at the same time being artful, it must submit to self-examination and be critical of its practices. The osteopathic school of medicine can not rest on the assurances afforded by the results of its search into the intricacies of operation, excellent as those have been.

Since the tenets of osteopathy rest chiefly on the premise of conveyance of "something" from the soma to the viscera, an analysis of the features that enter into that somaticovisceral transfer—their composition, operation, and synergism—must be made. Whether it be by interruption or facilitation of neural impulses traceable to a "lesion" or whether it be some other beneficent influence brought to bear by manipulation, it is requisite to inquire into the nature of that "something" and to ascertain if possible how it operates and what its manifestations are. Preconceived ideas of pain and of neuromuscular, segmental, or vertical organization of the nervous system must be eschewed for it may be found that the conveyance operates through neuro-muscular-glandular-circulatory relays and has no overt relationship to its manifestations either as an etiology or as a therapy. Applicability of the research will depend on establishing a connection between isolated studies of the transfer and the perverted physiology seen in practice.

Musculoskeletal reflexes to the viscera have received but slight study. What stimuli under what circumstances applied to the frame reach the viscera, what happens on the way, and what happens when they arrive are questions that are of unique interest to osteopathic physicians, to the future of osteopathy, and, if the answers are found, to the health and longevity of the race and to medicine by that reason. At present the interest or incentive to seek the answers reposes chiefly with osteopathic physicians.

The search must seek out the inadequacies of the body in defending itself that permit disease to prosper. Although workers in research have considered it their prerogative to be unhampered in questing and unfettered by fiat, they are, nevertheless, bound by their interest, by time, by facilities, and they are further obligated, to some extent, to carry out investigations in the field to which they owe their allegiance.

Investigators might well be guided by the intention to seek those projects which promise to contribute to the understanding of factors in the structural relationships of man, the aberrations or deviations of which will lessen his capacity to adjust to, or combat, the hazards to survival or to euphoria constantly threatening, or to ascertain if possible by what route or process manipulation of skeletal tissues fosters the efforts of the body to overcome morbidity and delay mortality.

An endeavor should be made to so relate the projects as to ascertain the manner and extent of operation of the osteopathic lesion and the response to manipulative therapy. This presumes that the lesion is not an entity but a link in a chain of events and may be the key link (or the weakest link) which not only institutes a process leading to disease but the alleviation of which enables the operation of forces that return man to health. For the purpose of this statement the term "osteopathic lesion" is not limited to osseous malalignments nor is it limited to derangements occurring in the vertebrae or trunk.

The contribution osteopathy has made and may make to general medicine lies with its peculiar recognition of factors that in some manner and to some degree hinder man from making the best uses of his resources either in adjusting to his environment, combating his enemies, or obtaining the most from his forage. It is with the identification and operation of these strains and stresses to the framework and the manner in which they affect the viscera that are of chief concern.

LEONARD V. STRONG, JR., D.O.
Member, Bureau of Research

CARDIAC ARREST

A noteworthy article appears in this issue of THE JOURNAL.[1] It is noteworthy not because it purports to present new or original material, but in that it offers an opportunity to osteopathic institutions to acquaint themselves with a workable plan for resuscitation of patients whose heartbeats have failed during surgery.

The subject of cardiac arrest has already accumulated a bibliography, found in the current literature of anesthesiology and surgery. Resuscitation of those who die in the operating room has even had its inning in the popular magazine field.[2] The Veterans Administration has made the Beck technic available through distribution, upon request, of a bulletin[3] originally designed for use in VA hospitals. The nation's press frequently reports cases of attempted resuscitation in the operating room. If followed, such attempts are found too often to have been unsuccessful—death occurred a few hours later.

But the evidence is indubitable that cardiac arrest can be overcome. There is little proof, however, that there is any widespread effort in American hospitals to make available the proper technic of resuscita-

1. Nagel, L. C.: The resuscitation of patients who die in the operating room. J. Am. Osteop. A. 51:527-530, July 1952.

2. Williams, G.: The patient's heart has stopped. Sat. Eve. Post 224: Aug. 18, 1951.

3. Beck, C. S.: Treatment of cardiac arrest. Veterans Administration Technical Bulletin. TB 10-65. July 18, 1950.

tion to those who need it. In this, as in many other matters, acceptance and apathy appear to be the order of the day.

Resuscitation of the patient dying in the operating room from cardiac arrest is a simple thing, relatively, when undertaken by the Beck technic. But within its very simplicity lies the danger of the self-assurance of ignorance. First, a few tools are required, kept prepared in a packet expressly for resuscitation. Second, the surgeon and the anesthesiologist should constitute themselves a team; prepared to move with rapid, but machine-like precision, once the diagnosis of cardiac arrest is made. The Nagel[1] article is an exposition in detail of the method of resuscitation.

Like any team the resuscitation team, once the technic is mastered, needs to keep itself conditioned by periodic routine drills. Never has the old adage of the danger of a little knowledge been better illustrated than by the bland assumption upon the part of many surgeons and anesthesiologists that *when* the emergency arises, they will be able to meet it—what could be easier? The surgeon opens up the thoracic cage, the anesthetist administers oxygen, easy! Yes, but the patient dies; the old tragedy is accepted, and forgotten. And when arrest comes again, the dead hand of failure finds the "team" even less ready to act.

This article is significant in that it is a call for preparation by osteopathic institutions to meet an emergency that is inevitable in any hospital doing surgery. It establishes for the reader the Beck technic by one thoroughly versed in its usage. A study of the article by our hospital staffs, and in particular by our surgeons and anesthesiologists, could result in the establishment for our institutions of teams capable of administering the technic. And Dr. Nagel has done much more than make available information that could be found elsewhere. He has seen the technic repeatedly demonstrated, has taken the course, and participated in the drills. Dr. Nagel has also provided himself with the defibrillating equipment. And in cognizance of the opportunity afforded him and the social obligation that it entails, he offers to demonstrate the technic in any osteopathic institution without fee. Certainly, such an institution will want to defray the expenses incident to the trip from Cleveland to the point of demonstration. Arrangements for a teaching demonstration should be made directly with Dr. Nagel.

We trust our osteopathic institutions will not manifest the same inertia seen too often in other institutions—the lethargy of self-satisfaction. The presentation of this article by THE JOURNAL, with the added emphasis given to it in this column should be productive of action. This opportunity is a most unusual one, particularly for our teaching institutions. Credit must be given to the Cleveland chapter of the American Heart Society for making the Beck course available, not only to Clevelanders concerned immediately in operating room procedures, but to those individuals nation-wide who choose to avail themselves of the opportunity. Many have done so, from every quarter of America. But special credit should be paid to Claude Beck, who has chosen personally to head the course and, by lecture and demonstration, point out its significance to those enrolled. Dr. Beck stands at the peak of his career and at a period in his life when he might be expected to conserve his energy, both in mind and body. Ample reason could be found for such conservation in the continuing development of his technic of cardiovascular surgery which in itself is sufficiently demanding of time and energy. But he chooses to make this contribution, month after month, because the conservation of human life is the tradition of medicine, and by contact with doctors he lends emphasis to that tradition as nothing else could do. His own personal sacrifice in itself, however, is also another of the fine traditions of medicine.

A great Roman pontiff said that it was remarkable with what little wit a government could be run. Unfortunately, centuries later, one can apply that very remark too often to institutional medicine.

Notes and Comments

An article of marked significance to anesthesiologists, surgeons, and members of the medical staff responsible for postoperative care recently appeared in *Surgery, Gynecology and Obstetrics.** Obstruction of the tracheobronchial tree by mucoid secretions is usually warned against in all articles on postoperative care, but the authors, in writing on asphyxia developing from such an obstruction, point out that it is too often unrecognized. Insults to the respiratory system keep occurring until a depression of the cough reflex occurs; a vicious cycle is produced in which more secretions are retained, and finally death occurs. Recommended treatment is aspiration of secretions, and immediate bronchoscopy of these patients who do not respond to aspiration. Too often the beginning of the process can be traced to poor anesthetic technics.

*Ende, N., and Ziskind, J.: Asphyxia by tracheobronchial secretions. Surg., Gynec. & Obst. 94:57-64, Jan. 1952.

Radioactive isotopes have become big business in America. A firm dealing in peacetime uses of atomic energy was founded in 1946, credited with being the first actual business to be built entirely from the by-products of nuclear fission. In that year the business totaled $30,000. The volume in 1952 is expected to reach $4,500,000, and the company is employing 1,077 persons. They offer isotopes, gauges, and by-products for every industry. More than 100 firms are now in this new and rapidly growing competitive field. An additional health use of radioactive isotopes anticipated for the near future is the sterilization of drugs and foods.

★ ★ ★

At least a dozen artificial kidneys are in use in various hospitals. Latest development is from the Westinghouse engineering laboratories commissioned by the

Peter Bent Brigham Hospital, Boston. All artificial kidneys are based on the same principle. Each is essentially a blood-washing machine to be used when a damaged or poorly functioning kidney can recover if given a rest. Kidneys handle about 800 gallons of blood a day to filter out the urea. The physiologic kidney osmosis is taken over by the artificial kidney for about 6 hours. In addition to its use in chronic and acute uremic poisoning, its use is anticipated in sulfa drug, barbiturate, or carbon tetrachloride poisoning and renal failure following surgery. The first artificial kidney was made 39 years ago but they remained virtually unknown until 1947 when New York City's Mount Sinai Hospital made an installation.

★ ★ ★

Evidence that vitamins of the B complex enter directly into chemical actions by which the body defends itself against disease and the physical stress of living was presented recently at the annual scientific meeting of the National Vitamin Foundation, Inc., an industry-supported institution for financing research in the nutritional field. Dr. Leonard A. Scheele, Surgeon General of the Public Health Service, in an address to the assembly stated that nutritional research was beginning to bear on our major health problems, including heart disease and cancer. Nutritional research that hinged upon the discovery and treatment of frank deficiency diseases is in his opinion no longer broad enough. An important report was presented by Dr. A. E. Axelrod of Western Reserve University to the effect that rats deprived of pantothenic acid, pyridoxine, and pteroylglutanic acid—B vitamins—were impaired in their ability to synthesize antibodies. Dr. Axelrod pointed out that the failure of the body to synthesize antibodies to meet the challenge of disease might prove a sensitive indicator of nutritional status.

★ ★ ★

Raisers of chicks and turkeys in the United States are now feeding antibiotics to speed the growth of their flocks. The practice may have dangerous results. Poultry commonly carry Salmonella which can cause food poisoning, enteritis, and typhoidal infections. Flocks fed on antibiotics are showing a tendency to produce resistant varieties of the parasite, so that the organisms will not only poison human consumers but be immune to treatment with drugs. Experimental evidence shows that it took but 3 days for a bacterial population resistant to the drug to appear in such birds.

★ ★ ★

An increasing interest in parakeets should alert doctors to the possibility of new outbreaks of psittacosis. Its symptoms are similar to those of influenza and pneumonia and may be treated with antibiotic drugs.

SPECIAL ARTICLES

Applications to Osteopathic Colleges

LAWRENCE W. MILLS

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For several years Dean William S. Guthrie of Ohio State University, Columbus, Ohio, has been publishing a manual of information, "Applications to the Professional Schools and Colleges," for faculty advisers and counselors of preprofessional students. This manual annually analyzes applications to professional schools—medicine, osteopathy, dentistry, veterinary, pharmacy, law, and optometry.

The manual for the 1951 fall term points out that applications for the various professional schools for the academic year 1951-1952 were fewer in number for most of the professional areas. Dean Guthrie states that the present reduced freshman class enrollments in liberal arts colleges show that the supply of professional students will be lower as the present smaller freshman classes progress through their preprofessional programs. It is probably reasonable to expect that we may return, but for a brief period, to the 1929-39 conditions, when most of the qualified applicants were admitted to professional schools and colleges.

He predicts that there is another period of boom enrollments coming in the late 1950's and after, when the increased birth rate beginning in the 1940's will reflect itself in college enrollments.

In 1951 preprofessional students who wished to enter colleges of law, pharmacy, and optometry found it relatively easy to do so. Colleges of pharmacy reported a ratio of 1.5 applications to each place in their freshman classes. Nine schools of optometry showed a ratio of 1.7 applications for each place. The same ratio existed in colleges of law. There has been a steady drop in the number of applications to colleges of medicine from 1947 to 1951. A similar drop of applications has occurred in colleges of dentistry.

Dean Guthrie in the preface to his recent manual points out that colleges of osteopathy uniquely have experienced a constant interest with little change in applications in the past 4 years.

ADMISSIONS AND APPLICATIONS TO COLLEGES OF OSTEOPATHY, 1948 to 1951

Year	Number of Colleges Reporting	Number to be Admitted	Number of Complete Applications	Ratio of Applications to Admissions
1948	6	496	2,055	4.1 to 1
1949	6	504	2,188	4.3 to 1
1950	6	508	2,488	4.8 to 1
1951	6	536	2,468	4.6 to 1

It is quite likely that osteopathic colleges will experience a decrease in the number of applications during the next several years. Most of the osteopathic colleges, however, report that for the 1952-53 school year applications have kept pace with those for the academic year which started in 1951. They also report that the quality of applicants is steadily improving. More and more of our successful matriculants are students who had decided on the study of osteopathic medicine prior to entering their preprofessional studies. This is due in large part to the fact that the preprofessional faculty advisers are becoming more and more aware of the status of the osteopathic profession and its educational program. Many preprofessional colleges today are cooperating with osteopathic colleges in the combined degree program. After successfully completing 3 years of preosteopathic work and the first year of professional work in an osteopathic college, a student is granted his baccalaureate degree by the preprofessional college. A number of selected preprofessional colleges now include in their catalogs a special 3-year curriculum, called "preosteopathic."

Another reason for the increased educational attainments of applicants for osteopathic colleges is the active interest in vocational guidance and student selection, which is being taken by divisional societies and many individual doctors.

It is to be noted that during the past several years the percentage of osteopathic matriculants who have completed their baccalaureate degree work or who have successfully completed more than the minimum requirements of the American Osteopathic Association —2 years of preosteopathic education—has steadily increased. In the fall of 1951 a little over 70 per cent of the 524 freshmen had received their baccalaureate degrees. Only 7 per cent of the entering freshmen in 1951 showed less than 3 years of preprofessional work. Three years ago a large number of the applicants to osteopathic colleges had completed the bare minimum of 2 years of preosteopathic work. The fact that our applicants for 1951 and for 1952 show an increased amount of preprofessional study and that the number of these applicants shows very little change is encouraging to the profession.

Undoubtedly, as preprofessional college enrollments dwindle, osteopathic colleges may expect a decrease in applications until 1957. It has been estimated that preprofessional college enrollment will reach its lowest stage during the school year 1954-55, and that from that time on the enrollment trend will be upward. By the early 1960's the number of preprofessional students will be as great as it was immediately following the war.

It, therefore, behooves the profession to keep up strong vocational guidance programs at the divisional society level, and to see that more and more individual doctors encourage high caliber young men and women to start their training as osteopathic physicians.

Notes on Classical Chinese Anatomy

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The beginning of the Chinese medical science may be placed in the age of the soothsayers and fortune tellers, who have left extensive records dating back approximately 1,900 years before the birth of Christ. Most of these writings have been carved on tortoise shells and bones, the so-called "oracle bones." It may be assumed that these early magicians had a rudimentary knowledge of the mammalian (including the human) skeleton, though no human bones have been identified in the vast collection of oracle-bearing artifacts.

It is unfortunate that the Chinese came into possession of an advanced system of philosophy at a relatively early period of their history. Confucius, the architect of this philosophic system, lived during the Feudal Age (Ch'un Ch'iu Period, 722-481 B. C.). The ethical concepts laid down in the Confucian teachings support the family and the state and were in turn adopted and supported by the imperial court and the learned scholars. The incipient science, as professed by the magicians, geomancers, astrologers, alchemists, and physicians was scorned by these scholars.

The adherents and practitioners of the pseudosciences were mostly men of lesser intellect; those among them who felt the need of a sheltering philosophy turned to Taoism. Little is known about the emergence of Taoism as an ethical doctrine. Later students of the cult regard a mythical figure, Lao Tsu, as its founder, and they attribute to him the authorship of the "Tao Te Ching," a book containing the basic principles of a philosophy which in its pure early form demands a return to a simpler life and disclaims the worldliness and its complications. The doctrine laid down in the "Tao Te Ching" (probably written about 240 B. C., or later) was from its inception in conflict with the older Confucianism generally favored by the imperial court and by the scholars. The opposition of the latter to Taoism and to early science forced a union between the adherents of Tao with the magicians, physicians, and fortunetellers. This unholy alliance led to an all around corruption: by 600 A. D. the pure doctrine of the "Tao Te Ching" had become corrupt and was permeated with symbolism, superstition, and charlatanry. This development was fatal for early Chinese medicine and for science generally, for everything connected with Taoism automatically became suspect and was looked upon with scorn by the scholars.

Nevertheless, scientific advances did appear in early Chinese history at a slow, but steady rate. An accidental discovery was at once relegated to magic lore by the scholars and became the property of the

Taoists by default. The latter could not do better than smothering such advances with a welter of mystic speculation.

Modern Chinese scientists who possess some knowledge of the obsolete characters which are so frequently employed in the writings of the later Taoists and their followers may find a rich reward for their labors of sorting the chaff from the wheat; not only will they add to a reconstruction of the early classical Chinese science but they may unearth hitherto unsuspected valid scientific observations.

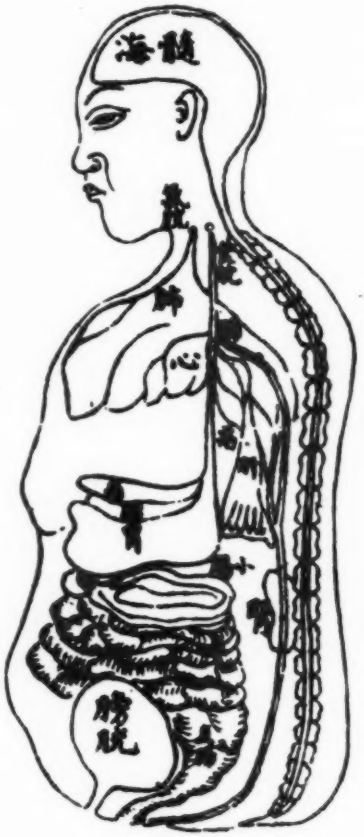

Fig. 1

This paper represents an attempt to collate some information on early Chinese anatomy by such a method of literary research. The material presented here is extracted from a manual for needle healers, a manual of acupuncture, edited by a certain Chang Kwei of Kwei Chi, and printed in Shanghai. The treatise consists of two volumes which are divided into twelve chapters, dealing mainly with the art of healing by means of sticking needles into various parts of the human body in order to relieve disorders. Several chapters, all well illustrated, deal with gross anatomy. No date of publication is given, nor are the various anatomic facts and fancies documented in any way so as to permit the reader to fix the time of discovery. The editor of the manual has had some contact with modern Western anatomy, for, interspersed in the text, we find several anatomical sketches showing manikins with distinctly Caucasian features. There is even a crude drawing of a low power section of the human epidermis. Obviously the editor desires to impress his Chinese readers with his familiarity with Western science. The main body of the book deals with diagnosis, treatment, and prevention of diseases and with vague historic references. The knowledge (or rather lack of knowledge) set forth in the book is probably nearly as old as recorded Chinese history.

Though it is admitted that various physicians of later ages (Wu Tai, 907-960 A. D., Sung Dynasty, 960-1127 A. D., and others) have added their share to the body of medical lore, the editor takes pains to put the origin of most of the work into the earliest period of Chinese history (Han Dynasty, 206 B. C.-220 A. D.) or even the era of the mythical Yellow Emperor, the supposed ancestor of all legitimate Chinese rulers and the fountainhead of all wisdom.

A passage found in the introductory chapter of the manual shows how the editor derives the origin and history of the needle treatment from the words of the sages of antiquity. The passage quoted here records a supposed dialogue between Huang Ti (the Yellow Emperor) and the great ancient physician, Chi Po.

> Huang Ti: "If you needle for *malaria*, then what?"
>
> Chi Po: "There are two types of malaria; the concealed and the open one. The concealed malaria causes backache and a heavy feeling in the head. Heat and cold alternate and the heart beats fast and there is grumbling in the stomach. When the heat ends it is difficult to perspire. The patient sighs and his appetite is weak. The cold spells are shorter than the hot ones and the patient seeks reclusion. Urine passes with difficulty. This disease is very serious. The open type malaria begins with chills and heavy shivering. The onset of the heat comes later than in the concealed type and there is profuse perspiration. Cold spells predominate and the patient seeks warm places."

(The dialogue closes with a description of the places where needle punctures must be applied in order to treat the two kinds of malaria.*)

The anatomic data presented in the book deal exclusively with the viscera. In each case a diagram showing a given viscus is accompanied by an outline drawing of a human figure showing where needle puncture should be applied in order to relieve a given disturbance of the organ in question. Figure 1 shows a sagittal section of the human thorax and abdomen. Figures 2 and 3 give a ventral and a dorsal view of the contents of the thorax and abdomen. The points which are of greatest interest to us are those illustrating the strange misconceptions entertained by the early Chinese anatomists.

It is realized clearly that the digestive canal is a continuous tube and possesses a number of associated structures. Mouth, esophagus, stomach, small and large intestine, sigmoid colon and rectum are named, as are the larger digestive glands. The pancreas is not clearly differentiated from the spleen. The thyroid and thymus glands seem to be known but are not named. It is assumed that there exists a functional, if not an anatomic connection between the small intestine and the bladder. Thus, close inspection of Figure 1 shows a blind duct which is described in the text as originating near the ileocecal valve. It is assumed that the urine arises in the small intestine by a process of filtration or separation of the solid from the liquid matter.

*The term "malaria" used in this quotation is merely descriptive and should not be related to the infection called "malaria" in Western medicine. However, the Chinese text employed the characters meaning "bad air," and the English word is derived from the Italian words "mala aria," meaning bad air.

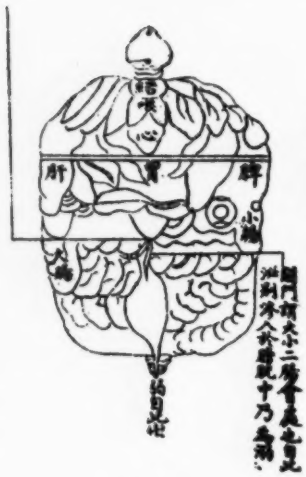

Fig. 2

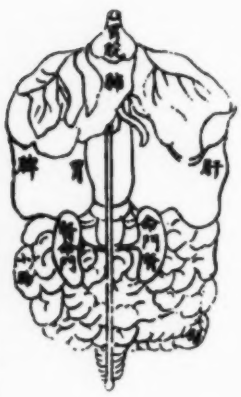

Fig. 3

The general shape and location of the kidneys is given correctly and their anatomic relation to other structures is described. The function of the kidneys is completely misunderstood. Since the formation of urine by filtration from the small intestine seems to explain this phase of physiology, a new role must be assigned to the kidneys: they are assumed to be the primary reproductive organs. The function of the testes is not even suspected; the scrotum, shown in Figure 2, becomes a superfluous appendage. (Unfortunately the volume does not contain a description of the female generative organs, obviously considered too delicate a subject to be discussed in Oriental medicine.) The kidneys are connected anteriorly directly with the heart and posteriorly with the external sex organs. (In Figure 3 the median duct is indicated by parallel lines.) The ureter is thus mistaken for the vas deferens, the male genital duct. The function of the urethra on the other hand is clearly realized for the text states that the duct leading outward from the bladder conducts both urine and seminal fluid. The latter arises by a sort of sublimation from the vital fluids which fill the heart.

Though the central nervous system is not specifically described in the manual, the illustration of it makes it clear that numerous misconceptions exist. The spinal cord is mistaken for bone marrow, the number of vertebrae is given as twenty-one, and it is assumed that the spinal cord fills all vertebrae.

The lung is described as weighing 3 pounds and 3 ounces, and consisting of eight parts, namely six leaves (lobes) and two auricles. The location of the lungs within the thorax is opposite the third vertebra. The connection between the nose and pharynx is correctly noted and the tracheal trunk is said to have nine rings. The large intestine weighs 2 pounds and 1 ounce. Its length is 21 feet and its width 4 inches. Its inner lumen has a diameter of 1 inch. The ascending, transverse, and descending colon are correctly described but it is stated that the large intestine has sixteen curves. The ileocecal valve is known to the early Chinese anatomists. The stomach weighs 2 pounds and 14 ounces and its length is 1 foot and 5 inches; its capacity is two liters (as solids) or 1½ liters (as liquids). The general shape and the main subdivisions of the stomach correspond closely to modern anatomy. The heart is described as having the shape of a lotus bud. Its weight is 12 ounces. It has seven openings and on the inside there are three hairs (chordae tendineae). The heart is located within the thoracic cavity opposite the fourth vertebra. It is filled with a small amount of vital fluid. The bladder weighs 9 ounces and its width is 9 inches. It contains a liter of urine which is filtered into it from the small intestine. The lower opening of the bladder leads to the external genitalia.

Kidneys and bladder are called vital organs. The kidneys are described as a set of filters through which vital fluid passes. Impotency in man is explained as dissipation of the vital fluids by the filtering device of the kidney.

"If the circulation is good," the Canon says, "and there is a hundred vessel pulse, the entertainment of such thoughts (sexual desire) fans the filter of the kidney; the semen flows and collects at the life gate and is ejected from there."

Fig. 4

Most of the manual is devoted to the exposition of the art of acupuncture and its supposed curative powers. The presentation is interspersed with Taoist teachings, and the lore of the magicians, astrologers, and dealers in the occult. The supposed elements—earth, metal, wood, and water—are assumed to act upon each other to maintain a harmonious balance in the body. The points of the compass are related to topographic anatomy in a curious way; for example, the liver is on the east side of the body. The dominant principle of the male *(yang)* and the submissive principle of the female *(yin)*, represented by symbols made up of lines and dots, are combined in a mystic diagram called Ba-Gua. This instrument is used by the physicians to ascertain the most auspicious time for performing surgery by acupuncture. Failure to follow the injunctions of the Ba-Gua, or misinterpretation of its symbols, results in lack of response to the treatment. Health and disease are explained by a theory of balance of the five principal viscera: heart, lung, liver, spleen, and kidneys. Major and minor shifts in activity of any one of the five major viscera influence all the others and cause imbalance and illness, just as an upset in the equilibrium of the elements produces imbalance in inanimate nature.

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Department of Public Relations

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ISONIAZID

The Food and Drug Administration on June 4, 1952, released one of the new anti-TB drugs for use under close medical supervision. The drug is isonicotinic acid hydrazide (isoniazid).

The Food and Drug Administration's action was taken on the basis of clinical and pharmacologic studies reported by drug manufacturers in new drug applications, filed under Sec. 505 of the Federal Food, Drug, and Cosmetic Act. This provision requires drug companies to establish the safety of new drugs before distributing them through regular drug channels.

For the present the recommended use of isonicotinic acid hydrazide is limited to the treatment of tuberculosis victims who are not responding satisfactorily to streptomycin therapy. The labels on the manufacturers' packages will state that it is "For use in the treatment of streptomycin-resistant tuberculosis, under close supervision of a physician." The drug is known to have been used effectively in some cases of miliary tuberculosis and tuberculous meningitis, which are frequently fatal.

The labels will also bear the legend required by the new Durham-Humphrey amendment on all prescription drugs—"Federal law prohibits dispensing without prescription." FDA medical officers said that there has not been as yet sufficient study to determine the place of the new drug in the treatment of tuberculosis. It is estimated that 4,000 tuberculosis patients are now under treatment with isoniazid.

NEW CHIEF OF PHS STATE SERVICES

Appointment of Dr. Otis L. Anderson as Chief of the Bureau of State Services, Public Health Service, has been announced by Dr. Leonard A. Scheele, Surgeon General of the Public Health Service of the Federal Security Agency.

Dr. Anderson succeeds Dr. Joseph W. Mountin, who died suddenly on April 26.

A former associate chief of the Bureau of Medical Services, Dr. Anderson will direct the broad federal-state and interstate programs of the Service. These programs encompass most of the public health activity carried on in cooperation with the states and with local communities. They include work in the fields of tuberculosis, venereal and chronic diseases, water pollution control, occupational health activities and vital statistics, along with the administration of the Public Health Service grant-in-aid program to states.

In addition to its headquarters' activities, the bureau also administers three field stations: The Communicable Disease Center at Atlanta, Georgia; the Environmental Health Center, Cincinnati; and the Arctic Health Center, Anchorage, Alaska.

Dr. Anderson, a native of Lincoln, Nebraska, entered the Commissioned Corps of the Public Health Service in July, 1930, upon completion of his internship at the Public Health Service Hospital, Baltimore.

PATIENTS IN STATE MENTAL HOSPITALS

Overcrowding in many State mental hospitals is continuing in spite of new construction, according to the Public Health Service of the Federal Security Agency.

A report, based on a survey by the National Institute of Mental Health, shows that nearly 700,000 persons—a figure equal to the population of the State of Utah—were patients in State mental hospitals during 1949.

Dr. R. H. Felix, Director of the Institute, said that 207 State mental hospitals supplied data for the survey. These institutions indicated that the degree of overcrowding was almost as high as in the preceding year—18.1 percent over the rated capacity. In other words, for every 100 beds a hospital was designed to provide, there were 118 patients in the hospital. In nine States the hospitals reported 30 percent or more overcrowding.

In 1949 State mental hospitals had only 2,100 physicians, Dr. Felix said, including superintendents and interns, to provide treatment for the nearly 500,000 patients resident in the hospitals each day during the year. The shortage of personnel continues to be severe among physicians, clinical psychologists, psychiatric social workers, nursing personnel, attendants and other therapeutic workers.

For the whole United States, there was a ratio of slightly more than three mental patients per 1,000 civilian population. The survey indicates southern and western States have relatively fewer facilities for the mentally ill than northern and eastern States. For example, New York took care of 5.6 patients per 1,000 population, as compared to 1.7 by New Mexico.

Copies of the report may be obtained without charge from the National Institute of Mental Health, Public Health Service, Bethesda 14, Maryland. It is entitled *Patients in State Mental Hospitals*: 1949, Mental Health Statistics Current Report IMH-B52, No. 1.

NEW ASSOCIATE CHIEF OF PHS MEDICAL SERVICES

Dr. G. Halsey Hunt has been appointed an Assistant Surgeon General of the Public Health Service, Federal Security Agency, Surgeon General Leonard A. Scheele has announced. He will serve as Associate Chief of the Bureau of Medical Services, which is under the direction of Dr. Jack Masur. Dr. Hunt was formerly Chief of the Division of Hospitals.

The Bureau of Medical Services administers most of the direct medical care functions of the Public Health Service, managing its twenty-two hospitals located in major seaport cities and over 100 outpatient facilities. The Bureau also includes the Division of Foreign Quarantine, divisions concerned with medical, hospital, dental, and nursing resources, and is responsible for the administration of the Hospital Survey and Construction Act.

Entering the Public Health Service as a commissioned officer in 1936, Dr. Hunt served on the surgical staff of several of the hospitals. He came to Washington in 1945 to conduct a research study on medical group practice. In 1947 he joined the Bureau of Medical Services as Assistant Chief of the Division of Hospitals, becoming Chief in June, 1949, succeeding Dr. Otis L. Anderson, now Chief of the Bureau of State Services.

HEALTH AND WELFARE PLANS

Action by the Wage Stabilization Board revising GWR 19 on June 4 permits parties through collective bargaining to negotiate health and welfare plans best adapted to their particular circumstances and needs, within the general framework of stabilization principles.

The statement of considerations accompanying GWR 19 (Revised) explained: "Health and welfare plans are so varied that detailed requirements in terms of benefits, costs, or a combination of these and other factors unduly limit the parties in their choice of a plan which is best adapted to their particular needs."

GWR 19 (Revised) retains the provision of the original regulation, issued last December, requiring that parties desiring to establish or amend plans file a report on a prescribed form with the Board. The report will be acknowledged and, unless the parties are notified to the contrary within 30 days after the date of the letter of acknowledgement, they may put the plan into effect as of the effective date provided in the plan.

The revised regulation retains a list and definition of benefits covered. They are: temporary disability and paid

sick leave, hospital expense, surgical expense, medical expense, group life insurance, and accidental death and dismemberment benefits. Reports of plans providing benefits not specifically listed in the revised regulation, or providing benefits which though listed may appear, on preliminary review, to be unstabilizing are treated as petitions for specific Board approval.

Department of Public Affairs

JOHN W. MULFORD, D.O.
Chairman
Cincinnati

BUREAU OF PUBLIC EDUCATION ON HEALTH

JOHN P. WOOD, D.O.
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Birmingham, Mich.

ANNUAL MEETING OF THE BUREAU OF PUBLIC EDUCATION ON HEALTH

On May 20 and 21, 1952, the Bureau of Public Education on Health held its annual meeting at the Central Office of the A.O.A. in Chicago. Present were John W. Mulford, chairman of the Department of Public Affairs; and the members of the Bureau of Public Education on Health, John P. Wood, chairman; Forest J. Grunigen, Phil R. Russell, Hobert C. Moore, and Carl E. Morrison. Members of the official family and the employed staff of the Association were also in attendance from time to time.

This meeting was the first annual meeting of the Bureau to be held at a period other than immediately preceding the annual convention. The Board of Trustees of the A.O.A. had directed that the meeting be held at this time along with other Bureau meetings in order that the Bureaus would have sufficient time to perform their duties properly and to discuss the various problems which arise in the performance of their duties. The Bureau of Public Education on Health found that the allotment of 2 days, rather than the usual 1 day, enabled the Bureau to discuss fully all the different problems and matters brought before it and to give adequate consideration to the operation and development of the public education on health program of the profession.

A brief description of the meeting is difficult. The scope and breadth of the discussions and considerations of the Bureau cover nearly every aspect of osteopathic education and practice. The new licensing law in Kentucky, which defines osteopathy as follows: "'practice of medicine or osteopathy' means the diagnosis, treatment or correction of any and all human conditions, ailments, diseases, injuries or infirmities by any means, methods, devices or instrumentalities," and which recognizes the high quality and character of osteopathic education, was discussed. This law establishes for the first time in Kentucky an internship as a prerequisite to licensure. The important health laws enacted by the legislature of Pennsylvania at its 1951 session and which included osteopathic participation were recognized. The status of the osteopathic profession under voluntary health insurance plans was reviewed and the continued progress being made toward complete integration of the osteopathic profession under such plans throughout the country was examined. The problems which arise concerning the discriminatory operation of public hospitals in some areas of the country were carefully analyzed. The different types of public hospital laws and the effects of the differences in such laws upon the right of physicians to use such institutions were enumerated. A new policy regarding the use of public hospitals by all licensed physicians was adopted and will be submitted to the Board of Trustees for its approval. The recognition given to osteopathic education by state licensing bodies and other governmental agencies was emphasized. The changes in laws and regulations in regard to preprofessional educational requirements for licensure and their effect upon the profession were discussed. The various types of supplemental health laws which have increased in number so greatly during the past 5 and 10 years were reviewed to see if any new trends or changes of interest to the profession were occurring.

In the main, however, the Bureau was concerned at this meeting with the development of public education on health programs at the divisional society level. In some states, the Bureau, at the request of the divisional societies, has offered its personal assistance in the organization of the public health programs and in the outlining of the objectives which properly come within the scope of such a program. Some of the divisional societies with few members and in whose areas the laws are limited have benefited from the close contacts that have developed within the last year between them and the Bureau in an effort to stimulate and expand the public health activities of the profession. The Bureau has always emphasized the importance of active and alert public education on health programs in all the states. The movement of osteopathic physicians from state to state depending upon the health needs of the people demands that the public education on health programs throughout the country be equivalent. The Bureau has, as one of its responsibilities, the elimination and prevention of restrictions and impediments which prevent licensed osteopathic physicians from being able to participate fully in the public health programs of all states. A physician in this modern day no longer knows in what state he will practice the rest of his years. Changing economic and social conditions have resulted in a shifting of population areas in the country and, as a result, areas in which osteopathic physicians some time ago were few in number now have greatly increased need for such doctors. The Bureau of Public Education on Health has, therefore, the heavy responsibility of organizing and developing a uniform and progressive public health program for the osteopathic profession throughout the nation. This program has during the past year been particularly stimulated by the earnest cooperation of some divisional societies which have not in the past been active in the public education on health field. These societies now recognize the mutual interests of the national and state organizations in promoting the welfare and health of the public. The future of osteopathic education and practice rests upon the activities of such public education on health programs because only through them can the osteopathic profession be assured of being able to make the maximum contribution to the betterment of the nation's health of which it is capable and which it is anxious to make.

COMMITTEE ON CHRISTMAS SEALS

STEPHEN M. PUGH, D.O.
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The design of the 1952 Christmas Seal has been chosen and is now in production. It is from the studio of James Madison, Chicago artist who makes seal drawings his specialty.

The focal point of the 1952 design is the Christmas star, in yellow and white against a Christmas-red background. From the star a powerful white ray carries across the seal to the symbolized drawing of a microscope, circled by the words, "Research—Education." The year and word "Osteopathy" complete the message.

The style of the seal is modern, inspired, according to the artist, by the Central office building design, but its appeal is as old as the campaign itself. It asks that the generosity of the season of the Star be made to shed its fullness on the work of osteopathic education and research.

The Committee is to have a booth at the Atlantic City convention. Everyone is urged to visit it.